

An Investigation
into the Validity of Norms
with Special Reference
to Urban and Rural
Groups

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AN INVESTIGATION
INTO THE VALIDITY OF NORMS
WITH SPECIAL REFERENCE
TO URBAN AND RURAL
GROUPS

BY
MYRA E. SHIMBERG, Ph.D.

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To My Parents
SIMON JAMES SHIMBERG
and
ESTHER LIGHT SHIMBERG
With Gratitude and Affection

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An Investigation into the Validity of Norms With Special Reference to Urban and Rural Groups

CHAPTER I

INTRODUCTION

Mental testing requires no justification; it is now an indispensable part of the technique of the educational psychologist, the vocational expert and the psychopathologist. Whereas twenty-five years ago the available psychological tests could have been described in a pamphlet, nowadays whole books on tests fill our shelves and the supply seems inexhaustible.

This rapid growth is splendid in many respects, but it has led inevitably to hasty and inaccurate technique in many quarters. In a recent manual on tests (8), of which the present writer is a co-author, 126 rather widely used tests of a certain type were described. Of these at least one-fifth did not attain the low numerical level of sample which we had set as a minimum in standardization. Admitting that mere addition of numbers does not necessarily increase validity, it is, nevertheless, obvious that averages based on a sampling of the population that is less than fifty cases have little significance.

The applicability of norms, however, depends on many other factors besides the number of cases on which the tests are standardized. One has to consider the composition of the group from the standpoints of variability, sex, racial and national components, etc. Moreover, the original scaling of the test with the possible favoring of one group to the exclusion of others must be taken into account.

We present below the results of an analysis of our 126 tests in regard to the selection of subjects. Our analysis is based on the data included in the original articles. As stated above, a great many tests, 24.6%, were not well enough standard-

ized to pass even our low numerical requirements. The tests analyzed below represent, then, the upper 75% of our tests.

We believe that in the field of comparative psychology—in so far as it deals with the comparison of one human group with another—the result of the misuse of tests has been most marked. The asserted inferiority of any group over another may, perhaps, be laid to the tools utilized in the analysis rather than to any intrinsic differences in the groups themselves. No particular comment is necessary. These figures speak for themselves.

TABLE I

	<i>Taken into Consideration</i> 60.8%	<i>Not Taken into Consideration</i> 39.2%	
Sex			
σ , A.D., P.E.	<i>Given</i> 39.2%	<i>Not Given</i> 37.3%	<i>Not Given but Could be Figured From Given Data</i> 23.5%
	<i>Taken into Consideration</i>	<i>Not Taken into Consideration</i>	<i>Some Consider- ation Given</i>
Racial Composition	9.8%	88.2%	2.0%
Social Composition	11.8%	50.9%	37.3%
Numbers	<i>Large</i> 59.0%	<i>Fairly Large</i> 17.5%	<i>Adequate Only At Certain Ages</i> 23.5%

We have attacked this problem in the following manner: Having prepared two tests scaled and standardized according to the best known methods, we have used them in the comparison of two groups—urban and rural children. Our aim is twofold: 1. to examine the importance of the differentiation of norms according to sex, educational groups, localities, racial composition; 2. to inquire whether differences between our groups are a function of the group mentality or our tests as tools.

Each chapter, dealing with one of these topics, contains a summary of the pertinent literature. We have made no attempt to be exhaustive, since we have found it necessary to draw so many fields into our discussion.

Moreover, our research itself has touched only the fringes of a somewhat unexplored field. Our purpose will have been accomplished if it contributes to the more careful scrutiny of psychological articles on race and group differences.

CHAPTER II

THE CONSTRUCTION AND STANDARDIZATION OF INFORMATION TESTS A AND B

An information test of more than local import, adequately scaled and standardized, and adapted to clinical use, seemed to offer a virgin field for experimentation. Of the few information tests already in existence, none seemed to fill these requirements.

F. Kuhlmann and T. G. Foran were kind enough to send us the information tests which they use. Neither of these has, to our knowledge, been published and the standardization, if it exists, is unavailable. Doubtless similar material, in more or less embryonic form, is utilized in clinics all over the country.

For the most part, vocabulary tests similar to that in the Stanford-Binet have, despite certain shortcomings, been used as information tests. The three mentioned below have been so designated.

Whipple's "Range of Information" test is merely an extension of his vocabulary test, the words being so selected "that each shall be representative of some specific field of knowledge or activity."¹ From a performance one can ascertain the fields with which the subject is acquainted, *i.e.*, American history, golf, photography, etc. It is no adequate gauge of his commonsense information as a whole.

Pressey and Shively, in 1919 (2), utilized a test composed of 10 groups of 10 words each, representing 10 different fields. This test was designed to fit the needs of delinquents and since, moreover, it was loosely organized and not standardized, it need not concern us here.

Weeks, 1928 (5), constructed the Berkshire test, consisting of three sets of 50 words each (one taken from the Stanford-Binet), to be defined according to the multiple choice method, *e.g.*, pancreatic: nerve sweetbread universal panic-stricken.

We know of only two tests at all similar to our own:

¹ 6, p. 683.

Terman, in his "Genetic Studies of Genius" (3), mentions an individual information test devised for the comparison of average and gifted children. It is in part identical with the information section of the Stanford Achievement test, but is more reliable and covers a wider range. Each of the two forms contains 335 items, *e.g.*:

The earth is shaped most like a baseball, football, pear.

The house-fly spreads Bubonic plague, typhoid, yellow fever.

This is an extremely good test. But since it takes an hour to administer, it would have been impractical for our purposes even if it had been reported before we started our investigation. To our knowledge, no one besides Terman has published results on these tests, although they may be available in printed form. The test is not reported in full in "Genetic Studies of Genius."

Eastman, in 1926 (1), compiled an information test of 100 questions for use in the Wayne psychopathic clinic. While admirably adapted for the use for which it was intended, its questions are extremely local in scope, (*e.g.*, Name five car lines in Detroit), and thus not suited to our purpose.

The following paragraphs describe the construction and standardization of our tests A and B. We should like to emphasize the fact that A and B do not refer to alternative forms. Whenever the A test is referred to, it should be thought of as the test scaled on urban children, whereas the B test was scaled on rural children.

SCALING INFORMATION A

Construction. The first step in the construction of the test was the preparation of the material. In this preliminary work, we were fortunate enough to have the cooperation of a group of teachers of elementary and high schools. Questions which they submitted were recast, modified and supplemented until we had eighty questions² of varying degrees of difficulty, covering the different fields of commonsense information, *e.g.*, nature, industry, etc. They were so framed that they could not be answered by "yes" or "no." These questions were then mimeographed on two sheets (easy and hard questions being scattered throughout in irregular order) and tried out on 764 urban children in grades 4-12, inclusive. Not

² For test in detail, see Appendix.

more than two grades were taken from the same school. The distribution of cases follows:

TABLE II

<i>Grades</i>	<i>IV</i>	<i>V</i>	<i>VI</i>	<i>VII</i>	<i>VIII</i>	<i>IX</i>	<i>X</i>	<i>XI</i>	<i>XII</i>
<i>No. of Cases</i>	71	96	102	101	98	111	32	59	94

Since we desired, in this preliminary tryout, to test all the questions and not the individual children, it was extremely important that each question be attempted by each child. We secured the cooperation of the teachers in having the test given over a period of two or three days, so that each section should be given due emphasis.

From the returns we calculated the % of correct responses for each question. These %'s were converted into S.D. units,³ as may be seen from Table III. Unsatisfactory questions (because of ambiguity in interpretation or difficulty in scoring) were discarded.⁴

From the remaining 72 questions, 25 questions were selected in such a manner that there was approximately the same distance in S.D. units between each 2 questions. It was thus possible to state that the third question was as much more difficult than the second, as the 25th question was more difficult than

³ 54 pp. 396-400. Table is based on area of probability curve, assuming base line to be broken off at $\pm 3.0\sigma$.

⁴ Some of the answers encountered in scoring the papers were sufficient reward for the labor involved. Some of these gems are shared with the reader.

11. How is it that newspapers can be sold for less than the cost of printing them? "Because people put in ads about divorces."

25. Name three precious stones. "Diamonds, coal, gold." "Diamond, rubi, Plymouth Rock."

26. Why is the moon light at night? "So the sun can rest." "Because it is made of cheese."

54. Where does Congress meet? "In the Gulf of Mexico."

55. What is a civil war? "Where 2 enemies fight with arms agreed on beforehand."

58. Why did the Pilgrims come to this country? "To get gold and precious stones."

59. How many sides has a triangle? "Any number of unequal sides."

64. What is the freezing point of water? "North and South Poles."

69. What is vaccination for? "To rest and go to see the world." "It is a permit mark on a child's arm." "To show you're old enough to go to school."

71. Name four general reasons that prevent a would-be immigrant from entering the United States. "Whisky, Pistols, Germs, Piosnin."

74. Name five insects. "Americans, Italians, Finnish, Swedish and Spaniard." "vilin, catar, piano, drum, float."

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TABLE III
PRELIMINARY SCALE A

Questions Arranged in Order of Difficulty for Urban Children

σ	% Passing	
.72	99.0	What are the colors in the American flag?
.82	98.7	Of what are shoes made?
1.06	97.5	How many cents are there in a quarter?
1.08	97.4	How many hours are there in a day?
1.19	96.6	What may we expect when we see heavy black clouds?
1.32	95.5	What holiday comes in December?
1.36	95.1	How do you know a policeman when you see him?
1.37	95.0	What is our national song?
1.45	94.1	Who is president of the United States?
1.47	93.8	To what public building can you go for books?
1.51	93.3	How much does it cost to mail a letter to any city in the U. S.?
1.54	92.9	What people were in America when the white men came?
1.71	90.3	Of what is butter made?
1.74	89.8	What state do you live in?
1.77	89.2	What holiday do we now celebrate that was first celebrated by the Pilgrims?
1.88	87.1	How many sides has a triangle?
1.93	85.9	How old must you be before you can vote?
1.93	85.9	Of what is paper made?
1.94	85.8	How many months are there in a year?
1.94	85.8	Where does the sun rise?
1.95	85.5	How many states are there in the U.S.?
1.95	85.5	Name four different trees.
1.97	85.1	Who was the first president of the U. S.?
2.07	82.7	How many pints are there in a quart?
2.08	82.3	Name five vegetables.
2.09	82.1	What do the stars in the American flag represent?
2.13	81.0	What is the capital of the U. S.?
2.15	80.5	In your city, what is the youngest age at which a child can leave school?
2.18	79.7	What is the shortest month in the year?
2.19	79.3	What is the largest river in the U. S.?
2.35	74.5	Why did the Pilgrims come to this country?
2.36	74.2	What is a submarine boat?
2.37	73.7	Who is the Governor of your State?
2.41	72.3	What is the largest city in the U.S.?
2.47	70.5	For how many years is the president of the U. S. elected?
2.50	69.4	Who was the president of the U. S. during the World War?
2.55	67.7	Name three precious stones.
2.57	66.9	Why should we kill flies?
2.58	66.7	Why is it dark at night?
2.67	63.2	Name a country in Europe which is a republic.
2.67	63.2	How many weeks are there in a year?
2.68	62.7	What three things do most plants need in order to live?
2.78	59.0	Why don't we see the stars in the day time?
2.79	58.6	About how often do we have a full moon?
2.79	58.6	Where does Congress meet?
2.81	57.7	How does the beating of your heart keep you alive?
2.83	57.1	What is the value of the smallest silver coin we use?
2.88	55.1	What causes an eclipse of the sun?
2.90	54.3	Why do we celebrate the 4th of July?
2.91	53.7	What artificial waterway connects the Atlantic with the Pacific?
2.94	52.5	Name the greatest English writer of plays?
2.96	51.8	What is steam?
2.98	51.1	What form of government have we in the U. S.?

σ % Passing

3.05	48.0	How can banks afford to pay interest on the money you deposit?
3.06	47.7	What is the economic value of Alaska to the U. S.?
3.24	40.5	Name five insects.
3.31	37.7	Of what is rubber made?
3.33	37.0	What is a civil war?
3.38	35.0	Why is the moon light at night?
3.39	34.6	Name two stones used for building purposes.
3.41	34.0	Name five cities in the U. S. that have a population of over half a million.
3.47	31.9	Name the Great Lakes.
3.58	28.0	How is it that newspapers can be sold for much less than the cost of printing?
3.72	23.4	What is the freezing point of water?
3.88	18.8	What is the usual economic result of the over-production of any commodity?
4.02	15.4	In what country is Vienna?
4.12	13.0	In what month of the year do the days begin to grow shorter?
4.28	10.0	What are the functions of the three branches of our Government? (In three words or phrases.)
4.39	8.1	Of what use are insects to flowers?
4.43	7.5	Name four general reasons that would prevent a would-be immigrant from entering the U. S.
4.82	3.3	What is the function of respiration?
5.19	1.3	What is a referendum in government?

the 24th. The test, as it appeared in its final printed form, is reproduced on the following page.⁵

Standardization. As subjects in the standardization of this test we secured the entire school population of a city of 47,876 inhabitants (1920 Census). This city was considered by its assistant superintendent to be "average." In a state survey in arithmetic it had fallen midway in the distribution.

The method of T. scaling, described in detail by McCall,⁶ was used in the construction and standardization of Scaled Information A. This probably gives more accurate results than either the percentile or age scales. McCall states that "the T scale is believed to be superior to any of the previously described methods. . . . It scales the total score. It employs the simple total. It allows each test element done to affect the scale score, thereby increasing reliability. Its units are equal in the generally accepted sense at all points on the scale."⁷

The tests were all administered on the same day under conditions as nearly standard as possible. Each teacher gave the test to her own pupils following precise instructions. Judging from our contact with superintendent and staff we are confident in stating that the conditions under which these

⁵ This test can be obtained from Stoelting & Co., Chicago, Ill.

⁶ For details, see 53, pp. 272-306.

⁷ 52, p. 96.

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A SCALED INFORMATION TEST

1. What are the colors in the American flag?
2. Of what are shoes made?
3. How many hours are there in a day?
4. What holiday comes in December?
5. Who is President of the United States?
6. What people were in America when the white men came?
7. What State do you live in?
8. Where does the sun rise?
9. Name five vegetables.
10. What is the largest river in the United States?
11. Why did the Pilgrims come to this country?
12. For how many years is the President of the United States elected?
13. What three things do most plants need in order to live?
14. How does the beating of your heart keep you alive?
15. How can banks afford to pay interest on the money you deposit?
16. Name five insects.
17. What is a civil war?
18. Name five cities in the United States with a population of over half a million.
19. How is it that newspapers can be sold for less than the cost of printing?
20. What is the freezing point of water?
21. What is the usual economic result of the over-production of any commodity?
22. What are the functions of the three branches of our government? (In three words or phrases).
23. Name four general reasons that will prevent a would-be immigrant from entering the United States.
24. What is the function of respiration?
25. What is a referendum in government?

NAME _____

SCHOOL _____

AGE: Yrs. _____ Mos. _____
GRADE _____

group tests were given were as ideal as possible. In all, 6477 usable records were secured.

The scoring was done by two trained workers.⁸ After correcting a large number of these papers a key was formulated,⁹ which contained acceptable answers, common non-acceptable answers, etc. All the papers were then graded according to these principles. Since the test had been so well scaled, it was practicable to give one point for each correct answer. No partial credits were allowed. Each pupil's score was the number of questions answered correctly.

⁸ One was the author. The other was Miss Marjorie Meehan, to whom the writer is extremely indebted for her painstaking and reliable work.

⁹ See Appendix.

The exact procedure as outlined by McCall for T scaling was then followed. Papers from our 886 12-year-olds were separated from the others, and the percentage of 12-year-olds passing each question was determined. (See Table IV). The percentage of 12-year-olds exceeding plus half those reaching 0, 1, 2, . . . 25 questions was then computed. From these percentages the scale score (in S.D. values) was determined from the table furnished by McCall.¹⁰ Since the 12-year ability did not include scores as low as necessary, the scale was extended at the lower end by repeating the above processes for question 0 in the case of 10-year-olds. Since the scale score for question 0 was 3 points below their score for question 1, 3 points was subtracted from the 18 shown in Table IV. The same procedure for questions 22-25 was followed with 16-year-olds.

TABLE IV
T SCALING INFORMATION A

<i>Total No. Questions Correct</i>	<i>No. of 12-yr.-olds Pupils*</i>	<i>% Exceeding + Half Those Reaching</i>	<i>Scale Score</i>
0	0		15
1	1	99.94	18
2	1	99.83	21
3	6	99.43	25
4	2	98.98	27
5	8	98.42	29
6	15	97.12	31
7	29	94.64	34
8	37	90.91	37
9	49	86.06	39
10	69	79.40	42
11	92	70.32	45
12	96	59.71	48
13	108	48.19	50
14	113	35.72	54
15	83	24.65	57
16	62	16.47	60
17	45	10.44	63
18	30	6.21	65
19	19	3.44	68
20	12	1.69	71
21	9	.51	76
22	0		79
23	0		82
24	0		85
25	0		91

*At upper level, above first line, scale score is based on performance of 10-yr.-olds. At lower level, below second line, it is based on performance of 16-yr.-olds.

¹⁰ 53, p. 279.

The test was then standardized for age and grade. A discussion of these results is contained in the ensuing chapters.

In order to see if the test was local in significance, *e.g.*, in some way favored our particular group of children, it was tried out on a group (106) of tenth grade children in Springfield, Illinois, and 71 tenth graders in Portland, Oregon. In neither case were the new groups at a loss. In fact, each group did somewhat better than the original. This seems to rule out the possibility of the test's being very localized in import.

It was necessary, also, to measure the reliability of the test. Since it was found impossible to give the test twice and no duplicate form existed we correlated the separate scores on odd and even questions, and calculated the reliability of the whole test by the formula $rx = \frac{2rh^{11}}{1 + rh}$. The self correlation of 360 cases chosen at random from all grades was .83, P.E.01. This comes within the range of minimum reliability coefficients, as set forth by Garrett.¹²

Scaled Information A is now in daily clinical use at the Judge Baker Foundation, Boston, Mass., and has been found satisfactory as a test of practical commonsense information.

SCALING INFORMATION A

In the course of our investigation, it became necessary to make a test for rural children as Information A had been constructed for urban children. As far as we know, there are no precedents for this. It has always been taken for granted that tests scaled and standardized on white city children should be made the basis of comparison with other groups, but seldom indeed have the tables been turned. Velma Helmer attempted to devise tests "to demonstrate the possibility of improving the Indians' relative score at verbal tests by presenting situations which are probably more familiar to the Indian"¹³ than those found in standard tests. Reference was made to "hogun," "tepee," Indian customs, materials, etc. This obviously favored the Indian children. No such attempt has, to our knowledge, previously been made with rural children.

Construction. A preliminary test of 80 questions,¹⁴ was

¹¹ 51, p. 271.

¹² *Ibid.*, p. 269.

¹³ 58, p. 42.

¹⁴ See Appendix.

compiled from material submitted by rural teachers. Thirty-seven questions were identical with questions in the preliminary A test. As in the case of the former test, the author framed all the questions and included none which appeared to be merely local in significance, or highly specialized. These questions were given to all the children in an entire rural district. This covered 52 schools and included 416 children from the 4th-12th grades. It must be remembered that rural schools consist, in great part, of one-room schools, averaging 10-25 pupils from all grades. The distribution of cases follows:

TABLE V

<i>Grades</i>	<i>IV</i>	<i>V</i>	<i>VI</i>	<i>VII</i>	<i>VIII</i>	<i>IX</i>	<i>X</i>	<i>XI</i>	<i>XII</i>
<i>No. of Cases</i>	49	57	68	73	32	60	33	29	15

The tests were given by the individual teachers as before. The exact instructions followed may be found in the appendix.

From the returns, the percentage of correct responses for each question was determined (see Table VI) in the way already described in the previous section and the final test of 25 questions secured in the same manner as before. It is reproduced below.

TABLE VI

PRELIMINARY SCALE B

Questions Arranged in Order of Difficulty for Rural Children		
σ	$\%$ <i>Passing</i>	
.29	99.8	What may we expect when we see heavy black clouds?
.84	98.6	How many cents are there in a quarter?
.91	98.3	Of what is butter made?
1.37	95.0	How much does it cost to mail a letter to any city in the U. S.?
1.43	94.3	How can you keep milk from souring?
1.43	94.3	At what time of year do many leaves turn red?
1.45	94.1	What are the four seasons?
1.47	93.9	From what does maple sugar come?
1.57	93.5	What is our national song?
1.68	90.8	How many states are there in the U. S.?
1.70	90.5	Name a vegetable that grows above ground.
1.73	89.9	How many pecks are there in a bushel?
1.74	89.9	What kind of dairy cow gives the richest milk?
1.77	89.1	How many pints are there in a quart?
1.82	88.2	Name the young of the sheep, cow, horse.
1.85	87.7	Name five fruits.
1.93	85.9	What do we mix with ice to help us freeze ice-cream more quickly?
1.93	85.9	What is the largest city in the U. S.?

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σ % Passing		
2.00	84.2	Who was the first President of the U. S.?
2.01	84.1	What is the capital of the U. S.?
2.01	84.1	Name four different trees.
2.02	83.7	Draw a square and an oblong.
2.03	83.6	How old must you be before you can vote?
2.03	83.6	What do the stars in the American flag represent?
2.08	82.3	Why should we kill flies?
2.08	82.3	From what animal do we get mutton?
2.09	82.1	Of what is paper made?
2.11	81.4	Name two birds that stay North in the winter.
2.15	80.3	Of what is rubber made?
2.16	80.2	Why does seasoned wood burn more easily than green wood?
2.17	79.9	Why are crops hoed?
2.23	78.2	How many sides has a triangle?
2.25	77.4	Name five crops.
2.29	76.4	What holiday do we celebrate that was first celebrated by the Pilgrims?
2.30	75.9	Who is the Governor of your State?
2.38	73.3	What is the shortest month in the year?
2.42	72.1	What tree doesn't shed its leaves in the Fall?
2.46	70.7	Why is it necessary to limit the hunting season?
2.47	70.3	Tell one way of finding out the age of a tree.
2.60	65.6	Why don't we see the stars in the daytime?
2.61	65.4	Why is it dark at night?
2.61	65.4	What kind of cloth is made from flax?
2.62	65.1	Name three states in the U. S. where cotton is raised.
2.64	64.1	Name a famous American inventor and tell what he invented.
2.65	63.7	How many weeks are there in a year?
2.71	61.4	What is a submarine boat?
2.73	60.6	About how often do we have a full moon?
2.75	60.0	What artificial waterway connects the Atlantic with the Pacific?
2.80	58.2	Name a country in Europe which is a Republic.
2.82	57.2	What is the correct temperature for a living room?
2.84	56.4	Name five wild flowers.
2.88	53.1	Where does Congress meet?
2.89	54.5	What form of government have we in the U. S.?
2.92	53.2	What is the economic value of Alaska to the U. S.?
2.94	52.7	What is steam?
2.95	52.2	Name the continents in order of size.
3.01	49.3	Why does frost form on the inside of the window pane?
3.06	47.3	Name three products made from wheat.
3.08	47.0	Name two animals that hibernate in winter.
3.08	46.5	Name three uses of forests.
3.11	45.3	What is the highest court in the U. S. called?
3.11	45.3	What causes an eclipse of the sun?
3.11	45.3	Name two stones used for building purposes.
3.17	43.3	Who was the President of the U. S. during the World War?
3.28	38.8	Give one reason for the rotation of crops.
3.32	37.2	How do sponges grow?
3.39	34.6	In what part of the day are the shadows longest?
3.42	33.7	Name three different plants from which sugar is made.
3.72	23.6	In what month of the year do the days begin to grow shorter.
3.84	20.0	Why is the moon light at night?
3.87	19.2	Name two differences between the barks of birch and oak trees.
4.20	11.4	How can you locate the Pole star?

Standardization. This test was then administered to 4875 rural children from eight districts sampling Northern, Southern, Eastern, Western and Central sections of the state. The

map outlines the districts included and shows how adequately the state was covered.

The tests were administered as before under precise instructions.¹⁵ The correcting was done by two trained workers,¹⁶ a key formulated,¹⁷ and the tests scored as before. The self correlation was found to be .84, P.E.01 (580 cases) for grades 4-8 inclusive. Norms for age, grade, sexes, union and one-room schools were secured. These will later be discussed in detail.

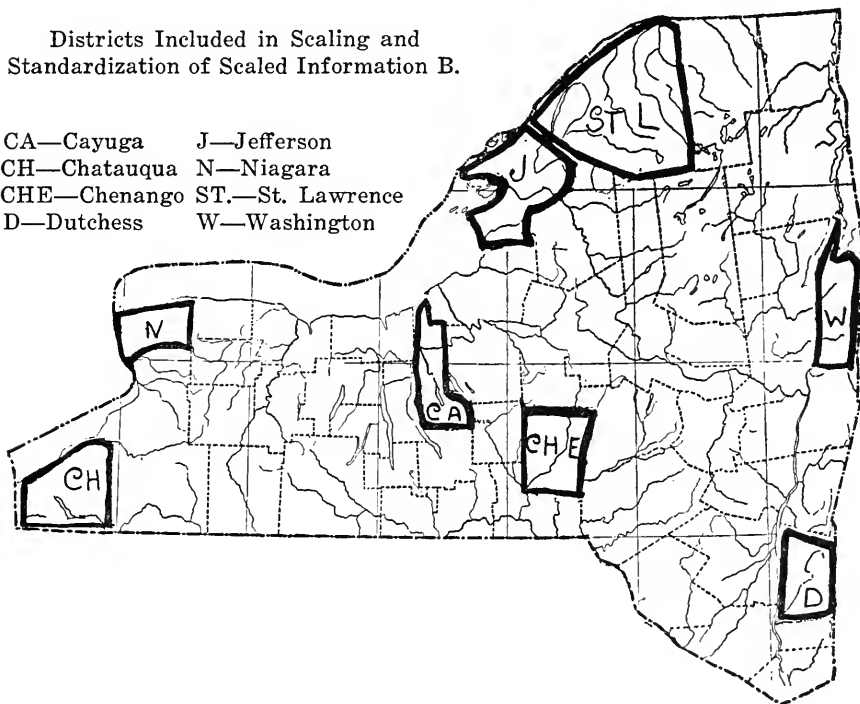
SUMMARY

1. Information Test A was constructed for clinical use. It was tried out on 764 urban children. It was T scaled and standardized on the entire school population (6477) of one city. The test was found to be statistically reliable.

2. Information Test B was scaled on 415 rural children

Districts Included in Scaling and
Standardization of Scaled Information B.

CA—Cayuga	J—Jefferson
CH—Chatauqua	N—Niagara
CHE—Chenango	ST.—St. Lawrence
D—Dutchess	W—Washington



¹⁵ See Appendix.

¹⁶ Again the author, this time assisted by Miss A. Anastasi who is to be highly commended for the painstaking care with which she accomplished this work.

¹⁷ See Appendix.

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from one district and standardized on 4875 rural children from eight districts in one state.

SCALED INFORMATION TEST—B

1. Of what is butter made?
2. How much does it cost to mail a letter to any city in the U. S.?
3. What are the four seasons?
4. What is our national song?
5. Name a vegetable that grows above ground.
6. Name the young of the sheep, cow, horse.
7. What do we mix with ice to help us freeze ice-cream more quickly?
8. Name *four* different trees.
9. From what animal do we get mutton?
10. Why does seasoned wood burn more easily than green wood?
11. Name *five* crops.
12. What tree doesn't shed its leaves in the fall?
13. Tell one way of finding out the age of a tree.
14. Why don't we see the stars in the daytime?
15. About how often do we have a full moon?
16. Name *five* wild flowers.
17. What is the economic value of Alaska to the U. S.?
18. Why does frost form on the *inside* of the window pane?
19. Name *three* uses of forests.
20. Who was the President of the U. S. during the World War?
21. Give one reason for the rotation of crops.
22. Name *three* different plants from which sugar is made.
23. In what month of the year do the days begin to grow shorter?
24. Why is the moon light at night?
25. How can you locate the Pole star?

AGE: Yrs. _____ Mos. _____
GRADE _____

CHAPTER III

AGE AND SEX DIFFERENCES

The previous chapter has dealt with the construction and process of standardization of Tests A and B. In this and the following chapters we shall consider in detail the results of trying these tests out on an urban and rural population.

Age and Grade Scores on Information A. Table VII shows the grade and age norms of the urban population on Test A. These norms are T scaled, so that 50 (in this case 50.1) is the average for 12-year-olds. It will be observed that the averages increase perceptibly from age to age and grade to grade.

TABLE VII
SCALED INFORMATION A
Urban Scores

<i>Age</i>	<i>No. of Cases</i>	<i>Aver.</i>	<i>σ</i>	<i>Grade</i>	<i>No. of Cases</i>	<i>Aver.</i>	<i>σ</i>
9	371	42.2	9.3	4	970	40.7	9.0
10	768	43.6	9.3	5	988	47.8	9.0
11	883	47.5	9.3	6	955	50.2	9.0
12	886	50.1	10.0	7	932	54.7	8.1
13	952	54.7	10.1	8	822	58.6	7.9
14	838	57.4	9.3	9	638	60.9	7.8
15	614	59.4	9.1	10	505	61.2	8.1
16	530	61.7	8.8	11	389	65.5	8.5
17	325	64.5	10.4	12	278	68.9	9.1
18	198	68.8	8.6	*College Freshmen			
				93	81.8	5.2	
				*College Seniors			
				69	84.9	5.3	

*These are not included in the age groups.

Table VIII shows us that the differences between consecutive ages and grades are entirely reliable. Conventional reliability is obtained when $\frac{\text{Difference}}{\text{Sigma}} = 3$. The $\frac{\text{Differences}}{\text{Sigma}}$ in these cases average 5.5 for age, and 8.0 for grade. We may say, then, that we have a test highly discriminative for age and grade levels. This, of course, makes it very useable in clinical practice.

It has been found that where adequate measures are used, the rate of mental growth can be shown to be fairly uniform.

TABLE VIII
 SCALED INFORMATION A
 Reliability of Differences—Urban Schools
 AGE

<i>Years</i>	<i>Actual Difference</i>	<i>σ Difference</i>	<i>Difference in σ units</i>	<i>Chances that true diff. is above 0</i>
9 & 10	1.4	.59	2.4	99.2 in 100
10 & 11	3.9	.47	8.3	100 in 100
11 & 12	2.6	.55	5.5	100 in 100
12 & 13	4.6	.48	9.6	100 in 100
13 & 14	2.7	.46	5.9	100 in 100
14 & 15	2.0	.49	4.1	100 in 100
15 & 16	2.3	.53	4.3	100 in 100
16 & 17	2.8	.69	4.1	100 in 100
17 & 18	4.3	.87	4.9	100 in 100

GRADE				
<i>Grades</i>				
4 & 5	7.1	.40	17.8	100 in 100
5 & 6	2.4	.40	6.0	100 in 100
6 & 7	4.5	.39	11.2	100 in 100
7 & 8	3.9	.39	10.0	100 in 100
8 & 9	2.3	.42	5.5	100 in 100
9 & 10	.3	.48	.6	74 in 100
10 & 11	4.3	.56	7.7	100 in 100
11 & 12	3.4	.69	4.9	100 in 100

Brooks (9), for example, has demonstrated by retests of children with a large battery of tests that growth is very nearly constant from 9-15. More nearly pertinent to our own findings is that of Terman (with the information test described in Chapter II), who reports that the age norms "gave an approximately straight line from ages 8-15."¹⁸ Weeks, on her vocabulary information test, also reports that "the average of grade scores showed a continuous increase."¹⁹

Besides the 6,265 urban children, a few college students were tested. Their averages are included in Table VII. While the test was obviously too easy for them, still it did discriminate between the Freshmen and Seniors.²⁰

¹⁸ 3, p. 299.

¹⁹ 5, p. 62.

²⁰ Dr. R. Brotemarkle (of the University of Pennsylvania) and the author have prepared an information test overlapping with Test A to the extent of five questions, the other 20 being scaled in a similar fashion for college students. Dr. Brotemarkle has used this scale in rather extensive tests of college students. His article, with results, is to be published shortly.

Graph I illustrates the regularity and consistency of the age and grade norms. Their deviation from a straight line drawn from start to finish would not be very marked. Also, the norms for age and grade are unusually consistent in regard to each other. This would undoubtedly be more often encountered in standardization work if large enough, unselected samples of the population were taken.

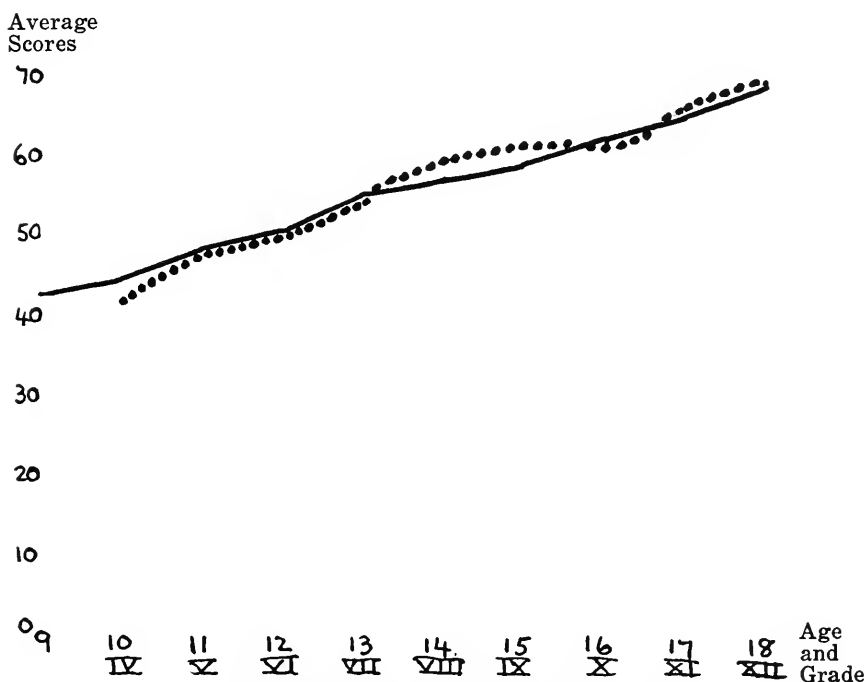


FIG. 1. Information A. Age and Grade Scores

Graph II shows the distribution of scores for sixth grade children. Its close approximation to the curve of normal probability is evident, and once more points to the value, or, in fact, sheer necessity, for accurate standardization, of using a large number of cases.

AGE AND GRADE SCORES ON INFORMATION B

Table XVII (in chapter IV) shows the age and grade averages on Scaled Information B for boys and girls, from one-room and union schools. The age averages for the one-room schools progress smoothly and consistently until age 15

Number
of
Cases

180

160

140

120

100

80

60

40

20

0

4

6

8

10

12

14

16

18

20

Raw
Scores

FIG. 2. Information A. Grade VI. Distribution

when there is a slump. This is readily explainable. The one-room schools proceed only as far as the 8th grade. At this juncture, pupils have to change to Union schools for the completion of their education. Consequently only the dullest children will be left in the one-room schools at the upper ages.

Graph III is plotted similarly to Graph I. While there is a reasonably consistent straight line relationship, the age and grade norms, however, are not as readily superimposable as in Test A. This is probably due to the fact that grade placings are much more flexible in rural schools. When 25 children from grades 2-8 are gathered together in one school room, it

is reasonable to conclude that their grade placings will be less rigid and more reliant on the criteria of the individual teacher than in the city schools.

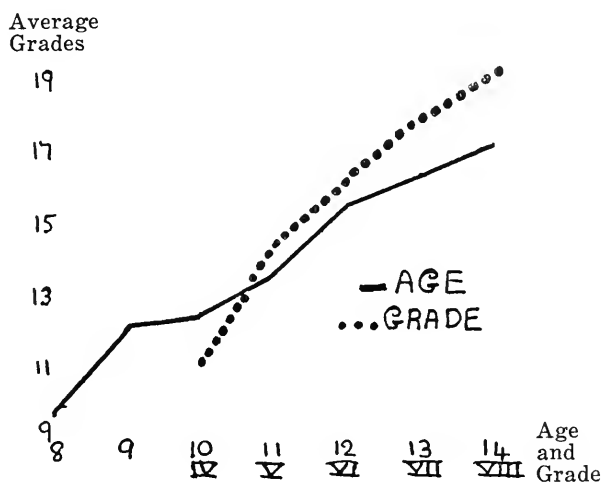


FIG. 3

Information B. Age and Grade Averages

For the union schools, there is a steady increase in the norms from ages 9-18 except for the age 13, which, for the girls, is the same as for year 12. This is not true of the boys' norms for those years, and we are at a loss to explain this one inconsistency. At no age, however, is there any slump.

As far as the grade norms go, progression from 4th to 12th is consistent and fairly smooth for the boys and also for the girls with one exception of a slight slump at grade 12.

Table IX shows the reliability of the differences from age to age and grade to grade. They are not as marked in this test as in Information A. However, the chances for a true difference average, in the case of age, 93.9 for one-room schools, and 87.3 for union schools; in the case of grade, 96.5 for one-room schools and 92.7 for union schools. These are rather significant differences.

Sex Differences. It is extremely regrettable that when the norms for Scaled Information A were compiled, no distinction was made between those for boys and girls. There was plenty of precedent for this lumping procedure. For example, in all the Pintner Paterson norms no attention is paid to

TABLE IXa
 SCALED INFORMATION B
 RELIABILITY OF AGE AND GRADE DIFFERENCES—
 ONE-ROOM SCHOOLS
 BOYS

<i>Years</i>	<i>Actual Difference</i>	<i>σ Difference</i>	<i>Difference in σ units</i>	<i>Chances that true diff. is above 0</i>
8 & 9	2.44	1.06	2.30	98.9 in 100
9 & 10	.40	.77	.52	69 in 100
10 & 11	1.08	.46	2.35	99.2 in 100
11 & 12	1.94	.41	4.73	100 in 100
12 & 13	.92	.39	2.36	99.2 in 100
13 & 14	.82	.36	2.28	98.9 in 100
14 & 15	.38	.40	.95	83 in 100
<i>Grades</i>				
3 & 4	2.60	.68	3.82	100 in 100
4 & 5	3.22	.32	1.00	84 in 100
5 & 6	2.08	.30	6.93	100 in 100
6 & 7	1.44	.30	4.80	100 in 100
7 & 8	1.40	.30	4.67	100 in 100
<i>GIRLS</i>				
<i>Years</i>				
8 & 9	2.86	1.01	2.83	100 in 100
9 & 10	.56	.53	1.06	85 in 100
10 & 11	1.92	.42	4.57	100 in 100
11 & 12	.68	.44	1.55	93.5 in 100
12 & 13	1.04	.40	2.60	99.5 in 100
13 & 14	.94	.41	2.29	98.9 in 100
14 & 15	.62	.47	1.32	90 in 100
<i>Grades</i>				
3 & 4	.98	.96	1.02	84 in 100
4 & 5	3.04	.35	8.68	100 in 100
5 & 6	2.06	.37	5.57	100 in 100
6 & 7	2.00	.35	5.71	100 in 100
7 & 8	.60	.32	1.88	97 in 100

sex differences. In such performance tests, where boys have so often been shown to excel, we should consider such a procedure exceedingly dubious. In comparing girls the averages are probably too high, for the boys, too low. In the 21 form-board and construction tests we analyzed, wherever there was sex differentiation (*i.e.*, in only 5 cases), a considerable superiority on the part of the boys was consistently found.

As far as verbal tests go, however, sex differences have even more rarely been taken into account. Even in the splendid standardization of the Thorndike McCall scale, so adequate as to scaling and number of cases, norms are not given for boys and girls separately.

TABLE IXb
 SCALED INFORMATION B
 RELIABILITY OF AGE AND GRADE DIFFERENCES—
 UNION SCHOOLS
 BOYS

<i>Years</i>	<i>Actual Difference</i>	<i>σ Difference</i>	<i>Difference in σ units</i>	<i>Chances that true diff. is above 0</i>
9 & 10	2.70	1.02	2.65	99.6 in 100
10 & 11	.82	.69	1.19	88 in 100
11 & 12	1.26	.60	2.10	98 in 100
12 & 13	2.36	.57	4.14	100 in 100
13 & 14	.44	.50	.88	82 in 100
14 & 15	.64	.42	1.43	92 in 100
15 & 16	.40	.43	.93	83 in 100
16 & 17	.64	.52	1.23	89 in 100
17 & 18	.90	.52	1.73	96 in 100
<i>Grades</i>				
4 & 5	3.20	.49	6.53	100 in 100
5 & 6	1.66	.42	3.95	100 in 100
6 & 7	1.30	.45	2.89	100 in 100
7 & 8	1.36	.40	3.40	100 in 100
8 & 9	.84	.33	2.55	99.4 in 100
9 & 10	.80	.37	2.16	98.3 in 100
10 & 11	.30	.82	.37	64.5 in 100
11 & 12	.48	.82	.59	73 in 100
GIRLS				
<i>Years</i>				
9 & 10	.94	.79	1.19	88 in 100
10 & 11	1.58	.59	2.68	99.6 in 100
11 & 12	1.74	.59	2.95	99.8 in 100
12 & 13	0			
13 & 14	1.36	.47	2.89	99.8 in 100
14 & 15	.90	.48	1.88	96 in 100
15 & 16	.46	.50	.92	82 in 100
16 & 17	1.12	.45	2.49	99.4 in 100
17 & 18	.36	.42	.86	80 in 100
<i>Grades</i>				
4 & 5	3.24	.42	7.71	100 in 100
5 & 6	2.68	.40	6.70	100 in 100
6 & 7	.12	.42	.29	62 in 100
7 & 8	1.34	.41	3.27	100 in 100
8 & 9	.90	.35	2.57	99.5 in 100
9 & 10	.66	.41	1.61	94 in 100
10 & 11	1.12	.42	2.67	99.6 in 100

Whipple, in a recent article, says: "The outcome of any intelligence test may be regarded as conditioned by a series of factors, such as age, sex, native ability, school training, practice and race. Of these factors comparatively little attention has been paid to sex, perhaps because the sex difference was regarded as of little magnitude or of little practical import. In the classification of pupils, for example, the scores of either

sex have been, *doubtless quite properly* (italics are ours), compared with the single standard score for the age or grade in question, which has been itself derived from the scores obtained by hundreds of children of both sexes combined, to furnish the standard age score or the standard grade score."²¹

Our results seem to cast grave doubt on that "doubtless quite properly." For, in test B,, the norms are carefully differentiated as to sex for both urban and rural children, and the results are remarkably clear cut. Graphs V-VII show that for grades 4-7²² the dotted line representing the girls' averages runs below and practically parallel to the continuous

TABLE X
COMPARISON BETWEEN BOYS AND GIRLS—Information B
Reliability of Differences—One-Room Schools

<i>Years</i>	<i>Actual Difference</i>	<i>σ Difference</i>	<i>Difference in σ units</i>	<i>Chances that true diff. is above 0</i>
(Favor of Boys)				
8	1.10	1.20	.92	82 in 100
9	.68	.84	.81	79 in 100
10	.52	.42	1.24	89 in 100
11	-.32	.46	-.70	76 in 100 (Girls)
12	.94	.39	2.41	99.2 in 100
13	.82	.40	2.05	98 in 100
14	.70	.37	1.89	97 in 100
15	.46	.49	.94	83 in 100
16	.42	.68	.62	73 in 100
<i>Grades</i>				
3	-.92	1.12	-.82	79 in 100 (Girls)
4	.72	.35	2.06	98 in 100
5	.88	.32	2.75	99.7 in 100
6	.90	.30	3.00	100 in 100
7	.34	.28	1.21	88 in 100
8	1.14	.33	3.45	100 in 100
Reliability of Differences—Union Schools				
<i>Years</i>				
9	-.68	1.10	-.62	73 in 100 (Girls)
10	1.18	.69	1.61	94 in 100
11	.42	.61	.69	76 in 100
12	-.06	.59	-.10	54 in 100 (Girls)
13	2.30	.51	4.50	100 in 100
14	1.38	.46	3.00	100 in 100
15	1.08	.45	2.40	99.2 in 100
16	1.02	.49	2.08	98 in 100
17	.54	.48	1.13	87 in 100
18	1.08	.47	2.30	98.9 in 100

²¹ 18, p. 111.

²² Only these grades were included in order to allow a comparison with the urban group, where only grades 4-7 were tested.

line, representing the boys' averages. At no place do these two lines cross. When we examine Tables X and XI, however, it appears, at first sight, that the difference is not entirely consistently in favor of the boys. For the one-room schools, the 11-year girls and the third grade girls exceed the boys. For the union schools, the 9- and 12-year girls exceed the boys. The average $\frac{\text{Difference}}{\text{Sigma "a"}}$ in these cases is .56 (71 chances in 100 for a true difference), which, of course, is very low. The other differences are in favor of the boys, the average number of chances in 100 for a true difference being 91.2 for one-room schools and 94.2 for union schools. For the urban group, the difference is consistently in favor of the boys and the average number of chances in 100 for a true difference is 94.5.

TABLE XI
COMPARISON BETWEEN BOYS AND GIRLS (2)—Information B
Reliability of Differences—Union Schools

<i>Grades</i>	<i>Actual Difference</i>	<i>σ Difference</i>	<i>Difference in σ units</i>	<i>Chances that true diff. is above 0</i>
(Favor of Boys)				
4	.82	.51	1.61	94 in 100
5	1.28	.40	3.20	100 in 100
6	.26	.42	.62	73 in 100
7	1.44	.45	3.20	100 in 100
8	1.46	.36	4.06	100 in 100
9	1.40	.32	4.38	100 in 100
10	1.54	.46	3.35	100 in 100
11	.72	.80	.90	82 in 100
12	1.36	.48	2.83	99.7 in 100
Reliability of Differences—Urban Schools				
<i>Years</i>				
9	1.18	.98	1.20	88 in 100
10	.88	.49	1.80	96 in 100
11	1.10	.57	1.93	97 in 100
12	1.28	.53	2.42	99.2 in 100
13	1.34	.76	1.76	96 in 100
<i>Grades</i>				
4	.80	.40	2.00	98 in 100
5	.98	.51	1.92	97 in 100
6	1.74	.47	3.70	100 in 100
7	.46	.58	.79	79 in 100

The 11- and 12-year divergence of the norms is not surprising. It has been found often that around or just before the period of adolescence, the balance is turned in favor of one sex for a time, although merely temporarily. The third grade and 9-year divergence may perhaps be explained on the

grounds of the paucity of cases. We had only 38 boys and 24 girls of the third grade from one-room schools and 20 boys and 33 girls from the union schools. This is the only place where we have any small number of cases, and, under no conditions, as we have often emphasized, can such numbers give positively reliable results. So, we may fairly conclude that, with the possibility of an exception for a short pre-adolescent period, our boys are consistently superior to our girls.

There is no reason to believe, moreover, that the content of the test particularly favored the boys. There were even a few more girls than boys in the original group on which the test was scaled. Table XII shows the comparison of 100 boys and 110 girls from District A on test B. By a strange coincidence, the girls exceed in 12 questions, the boys in 12 questions, there being an equal score on the first question. The average percentage by which the boys exceed the girls is 8.8%, while that of the girls exceeding the boys is 6.3%. These figures account for the age and grade superiority of the boys. It doesn't seem, however, that with the questions roughly stacking as we have indicated above there could have been any great selection in favor of the boys except in so far as a random group of information questions would always tend to favor them. Our results seem to indicate a genuine sex difference.

For a detailed analysis of the great mass of contributions to the study of sex differences, the reader is referred to the elaborate summaries so carefully compiled, at frequent intervals, by such authorities as Woolley (20), Hollingworth

TABLE XII
QUESTIONS FAVORING EACH SEX—Information B

Question	% in Boys' Favor	% in Girls' Favor	Question	% in Boys' Favor	% in Girls' Favor
1	0	0	14	18	
2		2	15		6
3		8	16		10
4		19	17	6	
5	8		18	6	
6	2		19		5
7	7		20	10	
8		3	21		3
9		3	22	8	
10	11		23		9
11	7		24	7	
12		6	25		1
13	15				

(12, 13), Goodenough (10), etc. Lincoln (15) has lately contributed an entire book on this subject.

Goodenough, comparing recent studies says, "The most outstanding impression which one gains . . . is the inconsistency of the various findings."²³ In the field of general information, however, there is some agreement, and it is gratifying to discover that our results are confirmed by those of several other investigators, whose work is summed up below:

✓The Berlin Child Study Association (17), studying 2,238 children just entering school, found that the number of concepts grasped by the boys exceeded that of the girls. Hall (11), in his study on Boston children, also found this to be true.

✓Pressey, testing 2,544 school children, finds that the "boys show a superior ability on the arithmetic test and a slightly higher average on the test for practical information."²⁴

✓King and McRory (14), testing Freshmen with Whipple's Range of Information, found that 61.6% of the boys reached the median of the girls.

✓Terman, in his study of gifted children, found that the "gifted boys excel gifted girls in general information, arithmetic and spelling."²⁵

Book and Meadows (7), testing 2,422 boys and 3,503 girls (all H. S. seniors) with the Pressey Mental Survey Scale, found that the boys were slightly superior to the girls on the whole test. The tests in which the boys most exceeded the girls were those in arithmetical ability and practical information. In commenting on the fact that Mrs. Pressey, testing subjects 9-15, found girls somewhat superior on the test as a whole, Book and Meadows say: "The superior rating of the girls is clearly due to the fact that the girls' development is accelerated from 1 to 2 years during this period."²⁶ It is interesting that the four cases in our own results where the girls excel the boys are 12 years or below, and in the 12-year group there is practically equality.

✓Goodenough, surveying the literature, says: "The weight of the evidence, therefore, seems to point to the conclusion that boys have acquired a truly wider range of general information than have girls by the time they arrive at the beginning of the grammar school period."²⁷

²³ 10, p. 441.

²⁴ 16, p. 333.

²⁵ 3, p. 306.

²⁶ 7, p. 77.

²⁷ 10, p. 453.

Eastman used an information test of 100 questions with juvenile delinquents. She finds the boys superior to the girls. "It may be presumed that boys, being less restricted in their freedom on city streets, acquire a more extensive knowledge of their immediate environment."²⁸

This falls in line with our own findings. It is true that most of our children didn't have city streets to roam, but it is true in the country as in the city that the boys have greater freedom than the girls. They are constantly out and doing, rubbing elbows with newcomers, and gathering bits of information from sundry sources, whereas the girls are kept indoors to a considerable extent, with domestic duties, etc. We are not surprised, then, to find that the boys' range of information is wider and more inclusive than that of the girls.²⁹

SUMMARY

1. Information A was found to be highly discriminative for age and grade. The sigmas of the difference averaged 5.5 for age and 8.0 for grade.

2. Information B was found to be highly discriminative for age and grade up to age 15. An explanation for the apparent discrepancy at the upper ages is offered in the text.

3. The distribution of scores was found to resemble closely that of the curve of normal probability.

4. The various graphs illustrate the consistency and reliability of our norms and distributions. This is believed to be due to the use of large numbers and adequate statistical procedure. This is urged as a requisite for all standardizations.

5. A clear cut sex difference favoring the boys was demonstrated.

6. Minute analysis of 210 papers of boys and girls led to the conclusion that the content of the test did not unduly favor the boys.

7. A review of the pertinent literature shows that, on the whole, our results are in line with those of other investigators.

8. We urge that all norms be sex differentiated when used for individual appraisement.

²⁸ *1*, p. 208.

²⁹ In view of the fact that the New York rural survey showed the boys to be considerably more retarded than the girls, this sex difference in information is particularly interesting. The rural schools are probably better adapted to the girl than to the boy. Most of the one-room schools, at least, are taught by women who tend naturally to stress female occupations.

CHAPTER IV.

DIFFERENCES BETWEEN VARIOUS RURAL SCHOOLS

The 4875 rural children who acted as subjects in our final B test were recruited from eight districts as shown on the map in Chapter III. In all, approximately 300 schools, one-room and union, were reached. This included 2330 children in one-room schools, 1808 from union schools, and 737 unclassified.

The one-room school "is that institution of the open country employing a single teacher and providing elementary education (*i.e.*, up to 8th grade only) for the children in the area in which it is located."³⁰ The average number of children in each school is approximately 25.

According to the government report on consolidated schools, the typical union school "is the result of uniting five districts or schools and abandoning four schoolhouses. . . . It serves an area of 36 square miles. . . . The school is organized on the 8-4 plan, enrolling 204 children in the elementary grades, 76 in the high school. . . . The teaching staff of 11 persons, including the superintendent, is divided on a basis of six or seven in the elementary grades and five or four in the high school. . . . It transports 110 (43%) of the children enrolled an average of 4.7 miles one way in 35 minutes."³¹

This chapter deals with two kinds of comparison, *i.e.*, 1. between the various localities tested; 2. between the two types of schools—one-room and union.

COMPARISON BETWEEN RURAL SCHOOLS IN DIFFERENT DISTRICTS

Tables XIII-XVI show the age and grade averages for the one-room and union schools in each separate district. The averages are, of course, not very reliable because they are necessarily based on such small numbers. For example, few one-room schools have more than two or three children at the upper grades, so that when one has canvassed all the schools in the district, the cases for each grade are still extremely limited.

³⁰ 26, p. 339.

³¹ 21, pp. 4-5.

Bearing this in mind, I think an inspection of the tables will reveal that there are no marked and consistent differences between the eight localities. Such variations as there are may doubtless be laid to the small numbers of cases. No district can be said to be consistently better than any other. The averages cross and re-cross each other and often end up the same. For example, taking 12-year one-room girls, there is a difference of only .58 between the highest and lowest average in the seven districts. This is confessedly one of the cases where the districts do stand together most closely. However, although at any particular age or grade one locality may seem to be considerably above another, still it is always true that at some other point it falls below. The averages for each district, on the other hand, become consistently higher with age increase and grade progress.

In our study, we have included schools as far west and as far east as possible, and very near the northern and southern boundary lines. (There is, in some cases, more distance between two rural districts than between any rural and urban location). We have found no clear cut differences between the various districts studied. We may conclude, then, that our tests do not tap information indigenous to one particular locality.

This is an extremely important point to ascertain. When, as is sometimes the case, tests are scaled and standardized on children in one locality only, it is doubtful if reliable group comparisons can be made with another locality. Here again the original norm material must be carefully scrutinized.

Differences Between One-Room and Union Schools.—A general description of the nature of one-room and union schools has been given above. The Census Bureau has estimated that at the end of 1922 there were 175,000 one-teacher and 13,000 consolidated schools in the United States. The consolidated schools are, of course, constantly on the increase.

All of our 638 high school subjects and 1170 of our grade school children were recruited from union schools. We have treated results from the two types of schools separately in all cases. Table XVII shows the age and grade averages for boys and girls in the union schools and the one-room schools. Scores from all union schools and all one-room schools respectively have been combined in this table.

TABLE XIII
 SCALED INFORMATION B
 AGE SCORES IN ONE-ROOM RURAL SCHOOLS

<i>School District A</i>				<i>School District B</i>				<i>School District C</i>		
<i>Age & Sex</i>	<i>No. of Cases</i>	<i>Aver.</i>	<i>σ</i>	<i>No. of Cases</i>	<i>Aver.</i>	<i>σ</i>	<i>No. of Cases</i>	<i>Aver.</i>	<i>σ</i>	
9 B	9	10.56	4.20	6	11.34	2.92	10	11.80	5.30	
G	8	9.24	3.66	10	12.20	4.84	15	10.74	3.50	
10 B	17	11.58	3.06	17	12.30	3.94	33	12.10	4.52	
G	17	11.94	2.58	33	11.84	4.18	31	11.46	3.50	
11 B	28	14.50	3.54	24	12.66	3.74	25	14.76	4.00	
G	22	14.64	3.60	21	12.62	4.16	20	13.50	4.10	
12 B	31	13.26	4.24	33	15.54	4.06	32	14.44	4.04	
G	41	14.76	4.16	37	14.18	4.20	29	14.58	4.68	
13 B	43	16.22	3.34	25	16.68	3.32	31	15.32	4.60	
G	20	15.60	4.24	28	16.28	3.26	27	15.96	3.78	
14 B	23	18.48	2.78	29	16.94	4.12	29	15.90	3.82	
G	20	17.10	3.32	21	16.42	2.04	20	15.50	3.94	
15 B	24	17.34	3.30	13	17.16	3.46	22	15.72	4.80	
G	17	16.88	2.88	18	16.78	3.20	9	17.66	3.12	
16 B	5			8	17.50	4.10	12	14.84	4.36	
G	11	16.64	3.16	9	17.44	3.24	4			
<i>School District D</i>				<i>School District E</i>				<i>School District F</i>		
9 B	6	13.34	2.12	5			5	15.00	3.58	
G	10	12.20	3.70	10	12.40	2.54	13	11.00	2.94	
10 B	24	13.92	3.38	19	11.74	3.80	30	12.46	4.22	
G	18	13.56	4.52	30	11.06	3.16	46	11.78	3.54	
11 B	21	13.28	3.96	28	13.22	5.22	42	13.24	3.16	
G	21	14.80	4.62	27	13.74	3.60	56	13.42	4.32	
12 B	31	16.10	4.56	33	15.18	3.42	67	16.14	3.92	
G	22	14.64	4.20	40	14.24	4.56	60	14.36	4.46	
13 B	16	17.88	3.08	36	17.28	3.60	56	15.96	4.68	
G	12	16.34	3.08	36	14.56	3.78	51	15.32	4.20	
14 B	20	18.10	3.44	22	18.10	3.06	49	16.60	4.26	
G	17	18.42	2.56	18	15.00	4.16	37	16.24	3.62	
15 B	18	18.56	2.94	22	18.82	2.96	32	17.88	3.28	
G	10	17.20	4.60	15	17.26	3.34	14	16.86	3.24	
16 B	5	16.60	1.96	14	17.86	2.60	8	18.24	2.82	
G	2			12	16.00	3.16	8	15.76	3.86	
<i>School G*</i>										
<i>Age</i>										
10 B	12.10	4.12	11							
12 B	18.40	3.24	10							

*In this school, the numbers were so small that only at two ages was it possible to compute averages.

TABLE XIV
 SCALED INFORMATION B
 GRADE SCORES IN ONE-ROOM RURAL SCHOOLS

<i>School A</i>				<i>School B</i>			<i>School C</i>		
<i>Grade and Sex</i>	<i>No. of Cases</i>	<i>Aver.</i>	σ	<i>No. of Cases</i>	<i>Aver.</i>	σ	<i>No. of Cases</i>	<i>Cases</i>	σ
3 <i>B</i>	3								
3 <i>G</i>	3								
4 <i>B</i>	65	11.90	3.74	35	10.88	4.38	50	10.16	4.28
4 <i>G</i>	28	10.72	3.46	37	11.06	4.48	47	9.90	3.30
5 <i>B</i>	41	14.66	3.18	34	14.18	2.92	33	13.12	3.28
5 <i>G</i>	38	12.78	3.54	26	12.84	3.38	37	13.86	2.66
6 <i>B</i>	27	16.70	2.44	34	16.36	3.34	56	15.36	3.34
6 <i>G</i>	45	15.26	3.00	23	15.60	2.82	33	15.48	3.34
7 <i>B</i>	25	18.84	2.64	37	18.02	3.00	36	16.94	3.10
7 <i>G</i>	30	18.26	2.66	31	17.46	2.00	30	17.40	3.16
8 <i>B</i>	22	18.90	3.04	16	18.00	3.44	24	19.00	2.52
8 <i>G</i>	13	19.46	2.38	24	17.76	3.00	11	18.64	2.82
<i>School D</i>				<i>School E</i>			<i>School F</i>		
3 <i>B</i>	32	8.68	4.00	38	10.64	4.40	46	10.92	4.10
3 <i>G</i>	18	8.56	4.70	70	10.20	3.70	58	9.62	3.60
4 <i>B</i>	32	12.00	2.96	43	13.98	3.20	78	14.36	3.12
4 <i>G</i>	34	11.00	4.34	28	13.86	2.06	65	12.66	3.92
5 <i>B</i>	26	14.92	2.70	42	17.28	3.08	55	15.76	3.74
5 <i>G</i>	18	15.34	3.00	51	15.32	2.76	55	15.00	2.40
6 <i>B</i>	26	17.00	3.88	36	18.94	2.06	67	17.02	3.42
6 <i>G</i>	25	16.76	3.22	29	17.20	3.12	65	16.88	2.90
7 <i>B</i>	34	18.06	3.18	25	18.92	3.18	51	19.90	2.70
7 <i>G</i>	15	17.80	3.00	22	17.72	2.72	35	17.98	2.84
8 <i>B</i>	20	19.40	2.06						
8 <i>G</i>	18	17.22	2.82						
				<i>Gr.</i>	<i>School G*</i>				
				4 <i>B</i>	9.72	4.26	14		
				5 <i>B</i>	14.84	2.52	12		
				7 <i>B</i>	16.78	4.26	9		

*In this school, the numbers in each grade were so small that only at three grades was it possible to compute averages.

TABLE XV
SCALED INFORMATION B
AGE SCORES IN UNION RURAL SCHOOLS

<i>School A</i>				<i>School D</i>			<i>School E</i>		
<i>Age and Sex</i>	<i>No. of Cases</i>	<i>Aver.</i>	σ	<i>No. of Cases</i>	<i>Aver.</i>	σ	<i>No. of Cases</i>	<i>Aver.</i>	σ
9 <i>B</i>	1			4			11	10.46	3.68
<i>G</i>	5			3			13	11.30	3.90
10 <i>B</i>	8	9.26	4.30	10	16.20	1.84	18	14.12	3.22
<i>G</i>	12	12.16	4.20	9	13.00	3.76	24	11.76	3.26
11 <i>B</i>	17	12.18	3.82	6			29	14.72	3.82
<i>G</i>	15	12.60	3.78	6			36	13.22	4.18
12 <i>B</i>	14	15.14	5.78	14	14.72	4.14	37	15.12	4.44
<i>G</i>	19	15.10	4.28	5			28	14.72	3.92
13 <i>B</i>	18	17.00	3.26	6			18	18.44	3.38
<i>G</i>	20	14.90	3.38	5			30	14.66	4.14
14 <i>B</i>	17	18.18	4.56	8	19.00	1.74	39	17.00	3.90
<i>G</i>	31	16.38	4.58	13	17.62	3.18	38	16.78	3.18
15 <i>B</i>	23	18.14	3.00	14	20.58	1.88	19	17.74	2.26
<i>G</i>	14	18.86	4.50	11	16.82	2.88	26	17.08	4.70
16 <i>B</i>	17	19.12	2.88	12	19.66	3.92	33	19.00	3.54
<i>G</i>	16	18.12	3.32	15	19.40	2.22	20	17.60	3.16
17 <i>B</i>	9	20.56	2.64	11	21.36	2.94	14	18.14	3.52
<i>G</i>	10	18.40	2.00	13	20.08	1.86	16	17.38	2.84
18 <i>B</i>	9	20.34	2.30	15	21.14	2.96	20	20.06	2.42
<i>G</i>	8	21.26	2.10	14	20.72	1.48	18	19.00	3.12
<i>School F</i>				<i>School G</i>			<i>School H*</i>		
8 <i>B</i>							19	5.42	3.46
<i>G</i>							28	4.58	3.44
9 <i>B</i>	3			1			34	6.24	4.20
<i>G</i>	9	12.56	4.20	3			40	7.90	4.34
10 <i>B</i>	12	11.84	3.32	5			42	9.72	5.18
<i>G</i>	30	12.54	2.01	10	12.60	3.56	46	8.86	4.14
11 <i>B</i>	22	14.28	3.80	18	15.66	4.10	29	12.72	3.96
<i>G</i>	29	14.38	4.20	8	16.00	3.00	40	14.04	3.84
12 <i>B</i>	24	16.74	4.44	24	15.92	3.40	39	12.94	5.78
<i>G</i>	43	16.40	4.02	8	15.50	3.58	53	14.70	4.94
13 <i>B</i>	30	17.40	3.60	20	18.70	3.96	52	16.24	3.92
<i>G</i>	32	16.68	3.24	18	15.88	3.34	46	16.44	3.06
14 <i>B</i>	39	19.16	3.32	24	19.08	2.98	42	16.48	3.78
<i>G</i>	49	17.82	3.30	14	15.56	4.68	27	18.18	3.18
15 <i>B</i>	39	19.30	2.38	27	19.30	4.00	37	16.40	5.50
<i>G</i>	41	18.32	2.92	20	18.00	3.54	50	17.64	3.50
16 <i>B</i>	23	18.92	2.92	11	21.54	3.42	35	18.36	2.28
<i>G</i>	30	18.40	3.24	13	18.54	4.38	22	17.82	3.06
17 <i>B</i>	34	20.58	3.56	6			16	20.38	2.20
<i>G</i>	35	20.14	2.04	16	20.38	3.06	16	18.38	2.98
18 <i>B</i>				9	21.88	1.92	5		
<i>G</i>				25	19.48	2.28	4		

TABLE XVI
 SCALED INFORMATION B
 GRADE SCORES IN UNION RURAL SCHOOLS

<i>School A</i>				<i>School D</i>			<i>School E</i>		
<i>Grade</i>	<i>No. of Cases</i>	<i>Aver.</i>	σ	<i>No. of Cases</i>	<i>Aver.</i>	σ	<i>No. of Cases</i>	<i>Aver.</i>	σ
4 <i>B</i>	24	10.26	3.78	9	12.56	3.10	42	10.86	3.74
<i>G</i>	29	9.68	3.42	15	12.46	2.96	45	10.46	3.60
5 <i>B</i>	17	13.82	3.42	17	15.24	3.36	35	14.88	2.52
<i>G</i>	26	13.62	3.34	6			36	12.72	2.54
6 <i>B</i>	20	16.30	4.02	8	17.00	3.00	36	16.06	2.68
<i>G</i>	24	16.42	3.02	4			26	15.54	2.80
7 <i>B</i>	13	17.00	2.34	7	18.14	1.82	30	17.40	3.62
<i>G</i>	14	15.86	2.60	13	17.92	2.44	37	15.64	3.38
8 <i>B</i>	17	18.88	3.02	4			41	18.96	2.74
<i>G</i>	18	17.44	2.76				36	17.62	3.00
9 <i>B</i>	23	19.60	2.72	15	21.40	1.50	18	20.12	2.24
<i>G</i>	18	19.22	3.12	20	27.70	2.92	32	18.68	2.42
10 <i>B</i>	9	19.22	1.98	17	20.30	3.06	16	20.76	2.98
<i>G</i>	5	19.80	2.04	14	18.86	2.44	15	17.40	3.36
11 <i>B</i>	9	21.88	2.34	6			8	19.50	1.94
<i>G</i>	15	20.74	1.90	20	20.90	1.48	7	19.56	1.40
12 <i>B</i>	6	21.34	1.38	17	21.82	2.38	12	21.50	1.20
<i>G</i>	7	21.58	2.06	13	19.78	1.68	12	19.84	3.20
<i>School F</i>				<i>School G</i>			<i>School H*</i>		
4 <i>B</i>	25	11.56	2.74	4			52	11.84	4.32
<i>G</i>	22	9.00	2.82	6			53	11.04	3.40
5 <i>B</i>	27	15.14	3.26	25	14.84	3.48	56	13.60	4.02
<i>G</i>	35	14.60	3.12	16	12.74	2.98	59	14.02	3.64
6 <i>B</i>	26	16.70	3.58	29	16.86	3.40	38	15.26	3.14
<i>G</i>	47	16.36	2.86	12	17.66	3.68	54	14.86	3.28
7 <i>B</i>	29	19.14	2.40	16	16.62	3.62	53	15.34	3.18
<i>G</i>	31	17.70	3.46	17	14.64	3.00	34	18.00	2.48
8 <i>B</i>	41	19.24	2.62	18	19.56	2.56	28	19.22	2.48
<i>G</i>	47	18.18	2.64	12	16.34	3.50	33	18.94	2.42
9 <i>B</i>	37	19.50	2.48	28	20.64	2.20	24	19.08	2.56
<i>G</i>	38	18.48	2.28	20	19.10	2.86	39	18.58	2.60
10 <i>B</i>	21	21.00	2.22	14	22.14	1.82	20	21.00	2.28
<i>G</i>	22	20.00	2.60	14	20.28	2.08	20	19.10	3.38
11 <i>B</i>	12	21.16	2.37	8	21.00	3.60 <i>Gr.</i>			
<i>G</i>	19	20.60	1.98	20	20.20	2.92	2 <i>B</i>	32	3.62
12 <i>B</i>	6	22.00	1.00	11	21.18	3.14	<i>G</i>	31	2.88
<i>G</i>	14	20.86	2.06	20	19.80	2.48			
							3 <i>B</i>	47	6.74
							<i>G</i>	53	6.24
									3.66
									3.42

*In this school, the different types of schools were not separated. Both one-room and union schools are represented.

TABLE XVII
COMPARISON OF ONE-ROOM AND UNION SCHOOLS

<i>One-Room</i>				<i>Union</i>			<i>One-Room</i>				<i>Union</i>		
<i>Yrs. and Sex</i>	<i>No. of Cases</i>	<i>Aver.</i>	<i>σ</i>	<i>No.</i>	<i>Aver.</i>	<i>σ</i>	<i>Gr.</i>	<i>No.</i>	<i>Aver.</i>	<i>σ</i>	<i>No.</i>	<i>Aver.</i>	<i>σ</i>
8 <i>B</i>	22	9.54	3.74				3 <i>B</i>	38	8.42	3.86			
<i>G</i>	18	8.44	3.82				<i>G</i>	24	9.34	4.56			
9 <i>B</i>	43	11.98	4.56	20	10.80	3.84	4 <i>B</i>	280	11.02	4.08	104	11.14	4.12
<i>G</i>	66	11.30	3.70	33	11.48	3.92	<i>G</i>	278	10.32	3.78	117	10.32	3.44
10 <i>B</i>	151	12.38	4.02	53	13.50	4.04	5 <i>B</i>	267	14.24	3.12	121	14.84	3.18
<i>G</i>	179	11.86	3.72	85	12.32	3.78	<i>G</i>	219	13.36	3.60	119	13.56	3.08
11 <i>B</i>	175	13.46	4.14	92	14.32	4.02	6 <i>B</i>	245	16.32	3.46	119	16.50	3.36
<i>G</i>	172	13.78	4.30	94	13.90	4.14	<i>G</i>	235	15.42	2.90	113	16.24	3.08
12 <i>B</i>	237	15.40	4.16	113	15.58	4.46	7 <i>B</i>	244	17.76	3.18	95	17.80	3.16
<i>G</i>	232	14.46	4.36	103	15.64	4.12	<i>G</i>	207	17.42	2.90	112	16.36	3.38
13 <i>B</i>	212	16.32	4.04	92	17.94	3.56	8 <i>B</i>	164	19.16	2.92	121	19.16	2.70
<i>G</i>	178	15.50	3.88	105	15.64	3.62	<i>G</i>	129	18.02	2.82	113	17.70	2.86
14 <i>B</i>	176	17.14	3.84	127	18.38	3.68	9 <i>B</i>				121	20.00	2.40
<i>G</i>	135	16.44	3.52	145	17.00	3.80	<i>G</i>				128	18.60	2.68
15 <i>B</i>	133	17.52	3.76	122	18.98	3.00	10 <i>B</i>				77	20.80	2.64
<i>G</i>	87	17.06	3.32	112	17.90	3.78	<i>G</i>				70	19.26	2.84
16 <i>B</i>	54	17.04	3.56	96	19.38	3.42	11 <i>B</i>				43	21.10	2.66
<i>G</i>	48	16.62	3.32	94	18.36	3.32	<i>G</i>				81	20.38	2.14
17 <i>B</i>				74	20.02	3.34	12 <i>B</i>				52	21.58	2.16
<i>G</i>				90	19.48	2.64	<i>G</i>				66	20.22	2.46
18 <i>B</i>				53	20.92	2.54							
<i>G</i>				65	19.84	2.52							

Table XVIII presents the statistical reliability of the differences between these two types of schools for the various ages and grades. Examining the girls' results, we see that in the age-to-age comparison, the union schools make a consistently better showing though the difference is not always reliable. The average number of chances for a true difference is 80.7 in 100. Dividing the age groups into those below 12, and those 12 and over, our averages are 88.8 and 67 (chances in 100) respectively. This is what we should expect, because at the upper ages all the brighter children are necessarily in union schools since one-room schools have no grades above the 8th.

As far as the grades go, the honors are evenly divided. For the 4th grade—perfect equality; for the 5th and 6th grades, an average of 85.5 chances in 100 for a true difference in favor of the union schools. For the 7th and 8th grades, 91 chances in favor of the one-room schools.

Turning to a consideration of the boys' data, we find that there is a fairly reliable superiority of the one-room schools

TABLE XVIII
COMPARISON BETWEEN ONE-ROOM AND UNION SCHOOLS
Reliability of Differences—Girls

<i>Years</i>	<i>Actual Difference</i>	<i>σ Difference</i>	<i>Difference in σ units</i>	<i>Chances that true diff. is above 0.</i>
(Favor of Union)				
9	.18	.83	.22	59 in 100
10	.46	.49	.94	83 in 100
11	.12	.54	.22	59 in 100
12	1.18	.45	2.60	99.7 in 100
13	.14	.45	.31	62 in 100
14	.56	.44	1.27	89 in 100
15	.84	.51	1.6	94 in 100
16	1.74	.59	2.9	99.8 in 100
<i>Grades</i>				
4	0			0 in 100
5	.20	.35	.57	72 in 100
6	.82	.35	2.30	98.9 in 100
7	—1.06	.28	—3.80	100 in 100 (1-rm)
8	— .32	.35	— .91	82 in 100 (1-rm)
Reliability of Differences—Boys				
<i>Years</i>				
9	—1.18	1.11	—1.06	85 in 100 (1-rm)
10	1.12	.64	1.8	96 in 100
11	.84	.53	1.6	94 in 100
12	.18	.50	.36	64 in 100
13	1.62	.47	3.45	100 in 100
14	1.24	.40	3.1	100 in 100
15	1.46	.42	3.5	100 in 100
16	2.34	.60	3.9	100 in 100
<i>Grades</i>				
4	.12	.47	.26	60 in 100
5	.60	.35	1.71	96 in 100
6	.18	.39	.46	67 in 100
7	.04	.37	.1	54 in 100
8	0			0 in 100

over the union schools at nine years. Otherwise the age results are consistently in favor of the union schools with an average of 93.4 chances. (The 9-year discrepancy may probably be explained as in Chapter III.) From ages 13-16 the difference is perfectly reliable. The normally advanced 13-year-old will, of course, be in high school.

Considering the grades, though, we have practically the same results as with the girls. In the 4th to 6th grades there is an average sigma difference (in favor of the union schools) of .81, which is, of course, not at all reliable. Above the 7th grade there is equality.

We can offer a plausible explanation for the sudden turn of the tables in favor of the one-room schools at the upper

grades. There is probably considerable selection at the upper ages. The one-room school children are more retarded for their age than the union school children, and with the fewer advantages and opportunities they have, it is not surprising that the dull ones drop out early. It has been shown that in New York three-fourths of the children in the one-room schools are in the first four grades (48). This is what we should expect. And if there *is* so much dropping out, is it not reasonable to suppose that there is in the topmost grades a veritable survival of the fittest?

We recently ran across the following surprisingly confirmatory statement by Foote (29), who made a study of 10,999 consolidated school pupils and 4653 one-teacher school pupils. "There is a pronounced belief among school people acquainted with the conditions that there is a higher relation between inefficiency and elimination in the one-teacher school than there is in the consolidated school. In other words, the one-teacher school retains a relatively larger number of its proficient pupils through the upper elementary grades and should, if all other factors were equal, show superior results of instruction in the latter grades."³² Foote's own results do not confirm this prophecy. Ours do, however, most markedly. The explanation lies in the fact that Foote was dealing with academic subjects whose results would clearly reflect the kind of teaching enjoyed. Our test would probably depend far more upon original innate ability than special teaching.

In regard to selection at the upper ages, the Assistant Superintendent of New York State writes as follows: "We are doing everything we can to encourage common school districts to send both their 7th and 8th grade pupils to a central rural or union free school whenever one is available. . . . It is true, however, that children are still prepared for high school in a large number of one-teacher schools. I think it is probably safe to say that when such children are still found in the one-room school, they represent two groups. Either they are the cream of the rural community because other pupils in the neighborhood of similar age and grade obtained their working papers as soon as they completed the 6th grade and reached the age of 14, and dropped out of school. Or else they are children who should actually be in high school,

³² 29, p. 346.

but are held back because they failed to pass some one of their Regents examinations for high school entrance.”³³

Turning to other studies, we find that we are in complete accord with the general conclusion that union schools exceed one-room schools in achievement.³⁴ Unlike most other investigators, however, we cannot show an entirely consistent or reliable difference except at those ages at which a fair comparison is impossible.

These comparatively small differences can probably be laid to the lesser opportunities in the one-room school. The union schools are far more elaborately equipped, both from the standpoint of health and educational facilities. The one-room pupils would doubtless be at a disadvantage in practically any field. No matter how much a test may tap “innate” intelligence, still the use of the tools at hand will contribute some small fraction to the final score. This would be sufficient to explain our differences.

If our differences are smaller than those of other investigators (as appears to be the case), it may be that it is because our test is more suited to both groups than those of other investigators. Standard tests, scaled on city children, have always been used and these may favor union school children. If so, we may here bring to bear, to a lesser degree, the argument used in relation to the comparison of city and rural children by such tests. This point will be elaborated in Chapter V.

SUMMARY

1. The rural schools were classified into one-room and union schools. The former represents the “typically” rural schools in outlying districts. The latter represents the consolidated schools serving five or more districts.

2. No reliable or consistent difference was found between the eight districts tested.

3. The union schools were found, in our study, to be fairly consistently (although not entirely reliably) superior to the one-room schools up to the 7th grade. Selection of cases above this grade in the one-room schools (and confirmatory evidence

³³ From letter from Miss H. H. Heyl to author.

³⁴ For a detailed account of the surveys dealing with rural schools the reader is referred to the bibliography (particularly to 30).

thereof) was offered as an explanation of the apparent change at the upper levels.

4. It is very important, since such differences exist, that material gathered for purposes of standardization, etc., should be carefully differentiated so that groups as heterogeneous as those represented above, should not be included in a haphazard manner.

CHAPTER V

RURAL AND URBAN DIFFERENCES ON INFORMATION TESTS A AND B*

Nearly thirteen million people in the United States live in villages. Every eighth person in this country is a villager.³⁵ It is evident, therefore, that any blanket statement concerning the mentality of the rural population has a direct bearing on our population as a whole. We can hardly damn our country dwellers without incriminating ourselves rather deeply. The Census Bureau has estimated that with a total population of approximately 112 millions in 1924, there were a little less than "10 million children enrolled in rural schools in the open country and in villages and towns of 1000 population and under."³⁶

We are unable to cite any really comprehensive study of the mental differences between rural and urban children. The thoroughgoing research undertaken by Baldwin and Fillmore (22) has not yet been reported in full. There are, however, a fair number of partial studies which we shall summarize below. In many of these the investigation of rural mentality has been merely incidental to the main purpose.

Pintner, in 1917 (37) tested the school population (154) of a village of 913 inhabitants. Using his Mental Survey test with which he had previously tested a large number of urban children, he found that the median index of mentality of the villagers was 10% below the urban norm. He concludes that the more intelligent families are leaving the village community.

Pyle and Collings (40), in 1918, reported the results of giving the entire population of school children 8-18 (2000) of a Missouri county the Pyle tests. The rural boys had 72.7% of the urban boys' standing; the rural girls had 77.5% of the urban girls' standing.

* We wish to thank the following rural superintendents for their splendid cooperation with us in our work: Mrs. L. T. DeOlloqui, Carthage; Miss M. S. Rundall, Amenia; Mrs. R. E. Brown, Granville; Miss M. L. Isbell, Norwich; Miss M. L. Rodgers, Moravia; Miss M. G. Hoffman, Lewiston; Miss R. M. Libby, Canton; Mrs. E. D. Grubb, Potsdam; Miss R. S. Gandy, Dennisville, N. J.

³⁵ 25, p. 15.

³⁶ 26, p. 339.

Pressey, in 1920, attempted a comparison of rural and urban children with the Pressey Primer Scale. He believed that since this test does not "involve literacy, nor school training, children from country and city should meet the examination on equal terms."³⁷ Also the scale is given so early that home influences might be expected to have operated to a much less extent than later. Of 183 rural children of 6, 7 and 8 years, only 22% scored above the median for age, as determined from city children. A former study with the Pressey Group scale had showed that only 27% of the rural children tested above the urban median (39). "It would seem reasonable to conclude then," says Pressey, "that the differences found by both scales . . . between urban and rural children were real differences in intelligence."³⁸

Irion and Fisher (34), 1921, found that 361 rural school children (11-16 years of age) scored 10 points below the urban norm on the National Intelligence test.

Hinds, 1922, comparing 68 rural children in Texas with urban norms on the Otis test concludes "that the country child is lower in general mentality as measured by the group mental tests than the city child."³⁹

Book, in 1922, reported the results of testing 7748 Indiana High School seniors, 1194 of whom were recruited from rural schools. His battery of 10 tests contained a practical information test. The median score of the rural group was found to be below that of the urban group. However, Book adds the following: "Rural schools have a larger percentage of seniors making the most superior grade of intelligence, while the city schools have proportionally more seniors making a high average intelligence."⁴⁰

L. S. Hollingworth, in 1926, summed up her impressions as to rural mentality as follows: "As regards the comparative frequency of gifted children in urban and rural environments, we have not much information at present. Such data as bear on the subject indicate that we shall probably find a greater proportion of gifted in the cities except in districts so remote from means of transportation as to have precluded migration of intellectual deviates to the city. With the easy facilities for travel at present existing almost everywhere in

³⁷ 38, p. 92.

³⁸ *Ibid.*, p. 93.

³⁹ 32, p. 123.

⁴⁰ 24, p. 235.

the United States, it is not surprising that we find relatively unintellectual performance in mental tests among rural school children."⁴¹

Terman, in his "Genetic Studies of Genius" (3), strikes somewhat the same note. Half of the parents of his super-normal subjects "were born in cities of 10,000 population or over, and almost a quarter in cities or towns of 1000 to 10,000 leaving *only* (italics are ours) a quarter for rural districts and towns or villages of less than 1000."

Some studies in our field are contributed by English authors:

Bickersteth (23), in 1917, tested 1200 children in the elementary schools of the Yorkshire Dales and of Leeds. The former represents extremely isolated rural districts, the latter an urban settlement. On the whole, the Dales children were found better in memory tests and the Leeds children in reasoning tests.

Thompson (42), and later Duff (28), working with the Northumberland mental test, found that the rural districts gave results more than a year behind the large cities.

Turning now to rural surveys in the United States, eight major ones warrant mention:

In the Virginia Survey (50), in 1921, the rural children were found to be from 1-1½ years behind the city children in the school subjects measured.

In the same year, 10,000 children in the counties and cities of North Carolina (44), and in 1922, 16,700 pupils in Kentucky (46), were tested in school subjects. The results in both cases were similar to those cited above.

Works, in the New York Survey (48), in 1922, found that on the Sigma Silent Reading test the rural scores, grade for grade, were considerably below city norms. This was true of arithmetic, history and other academic subjects.

The Indiana Survey (45), in 1923, found the one-room 8th grade reading scores to be 1½ years below Indiana city schools and the union schools ½ year below. Similar results were found in other school subjects.

In his Texas survey, 1925, Works (49) measured rural and urban children with the National Intelligence test. The one-room schools were found to be about 1½ years behind the city schools, and the union schools about ½ year retarded.

⁴¹ 33, p. 58.

O'Shea (47), in the Mississippi survey, 1927, tested grades 1 and 2 with the Pintner Cunningham scale, grades 3-8 with the National Intelligence test, and grades 9-12 with the Terman Group test. A significant difference in favor of the urban children was found to obtain.

Myers found that the Pennsylvania rural schools (10,621 8th grade pupils), on the Otis Classification test, rated 11% below the standard (36).

It will readily be noted that the evidence presented so far is extremely one-sided. Everyone agrees in favoring the urban child as far as mentality and school achievement is concerned. It is true that we have omitted, for the time being, one or two studies to be discussed later, but the bulk of the experimental work has been reviewed. We may now turn to the results of our own study.

The T scaling and standardization of Scaled Information A (on urban children) has already been described. It seemed to provide a good basis for the comparative study of urban and rural children. Six hundred and ten children from 50 schools in one rural district were tested. The administration of the tests was conducted as before. The individual teachers gave the test according to specific instructions. This method is particularly appropriate in the case of rural chil-

TABLE XIX
COMPARISON OF RURAL (DISTRICT I) AND URBAN GROUPS ON
INFORMATION A

Years	Rural				Urban			
	No. of Cases	Aver.	σ	No. of Cases	Aver.	σ	Diff. in σ Units (Favor Urban)	Chances that true diff. is above 0
9	42	39.1	8.4	371	42.2	9.3	2.2	98.6 in 100
10	65	42.7	8.1	768	43.6	9.3	.8	79 in 100
11	74	44.9	8.8	883	47.5	9.3	2.5	99.4 in 100
12	103	46.5	9.9	886	50.1	10.0	3.4	100 in 100
13	105	50.1	10.2	952	54.7	10.1	4.4	100 in 100
14	90	54.7	9.1	838	57.4	9.3	2.7	99.7 in 100
15	86	56.8	11.0	614	59.4	9.1	2.1	98 in 100
16	45	59.3	10.1	530	61.7	8.8	1.5	93 in 100
<i>Grades</i>								
4	127	36.3	6.8	970	40.7	9.0	6.5	100 in 100
5	125	44.6	7.3	988	47.8	9.0	4.5	100 in 100
6	116	50.1	6.3	955	50.2	9.0	.2	58 in 100
7	96	53.3	5.5	932	54.7	8.1	2.3	98.9 in 100
8	89	59.3	7.0	822	58.6	7.9	-.9	82 in 100 (favor rural)

dren. Pressey has pointed out the fact that these children are shy and not at ease with strangers. Names of the children and schools were omitted, so that there should be no impetus for cheating.

Table XIX shows the results in comparison with the urban figures. [With the single exception of grade 8, the urban groups exceed the rural.] The reliability of these differences is also contained in Table XIX. For the ages, there are 96.9 chances, on the average, for a true difference. [The rural children are about a year retarded all the way along.] Graph IV illustrates this clearly. The 13-year rural score is equal to the 12-year urban; the 16-year rural to the 15-year urban, etc. The grade differentiation is entirely reliable at grades 4 and 5. But above this the differences vary until at grade 8 the difference is in favor of the rural children. This is probably explainable on the basis of selection as we have already suggested in the sex comparisons.

On the whole, then, our results agree with those of previous investigators. [The urban children are approximately one year in advance of the rural children.]

Various explanations have been advanced to account for this deficiency. Pyle and Collings put forth the following possible reasons:

1. The city children are of better stock.
2. The environment of the city hastens development.
3. Better teachers and schools of the city give training that enables the children to understand better what is expected of them.⁴²

Pressey has commented on the fact that rural children are at a disadvantage through shyness, etc., when tests are administered by strangers.⁴³ O'Shea states that "the superiority of urban over rural pupils may be due to superior educational facilities in the way of more capable teachers, more extensive educational equipment and more time spent in school each year, as well as to superior native ability. It is probable that there is a selective process in operation . . . leaving the more capable stock to locate in the cities."⁴⁴

These quotations represent the general viewpoint of most of our authors. Environment in the form of poor opportuni-

⁴² 40, p. 538.

⁴³ 38, p. 96.

⁴⁴ 47, p. 226.

Average
Scores
(T-Scaled)
62-

60

58

56

54

52

50

48

46

44

42

40

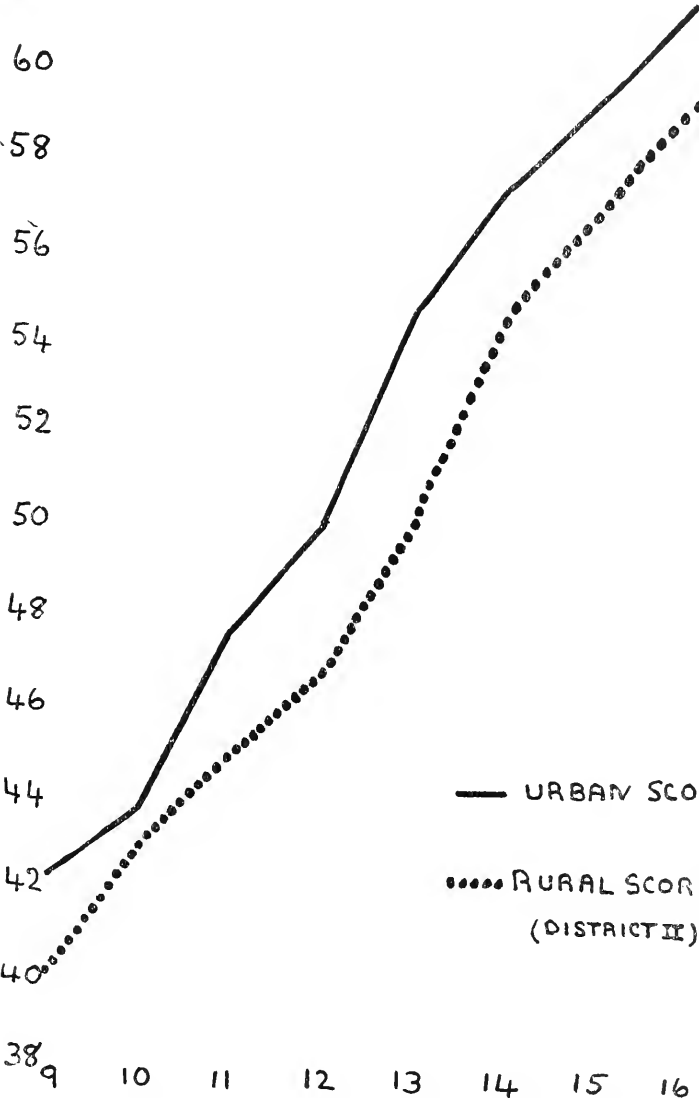
38

— URBAN SCORES

..... RURAL SCORES
(DISTRICT II)

9 10 11 12 13 14 15 16 Ages

FIG. 4. Information A. Urban and Rural Scores



ties of the child, or heredity, since the better stock has left, are invoked to account for the inferiority of the rural child. For the most part this *inferiority* is taken for granted. There is still another possible explanation, however. Perhaps the tests do not fit the rural children as well as they do the urban. The country children may be *different*, not inferior. A sociologist has recently stated our viewpoint rather clearly. "The farmer is neither peculiar nor unique, and not even inferior; he is just different. "Did you," says Halstead, "ever try to drive 13 pigs out of a cornfield when they did not want to go?" The city man has had no such experience. The problems of the farmer are not those of the city man and consequently his stock of ideas is not the same. If a word reaction test were given to a group of farmers, in 99 cases out of 100 the word Chicago would bring forth the response, "Sears Roebuck and Co.," while this response would not be at all likely to appear in a test given to city dwellers. The apperception masses of these two groups differ greatly, and most naturally the responses are divergent."⁴⁵

Perhaps our explanation lies not in the superior environment or heredity of one group over the other, but in the tests used to compare them.

It is certainly true that the majority of our tests are standardized on white urban children. Even where state-wide surveys have been made, the tests used were originally scaled on city children. In the first place, large numbers are more readily available in city schools. In the second place, city children have been considered "representative." And since it is urban educators who, as a rule, have made the tests, this is, of course, readily understandable. The same thing is true of inter-racial and national differences. The *white* man's tests are used as a standard with disastrous results for the other peoples.

In racial psychology, this unfairness of the testing is being realized in many quarters, and attempts to form an adequate universal test are being made. A glance at almost any of our current psychological magazines, however, will serve to show that Italians, Indians, Japanese, etc., are still being tested with our group tests and conclusions drawn with or without reservations. We shall discuss the absurdity of this in greater detail in our next chapter. One quotation will suffice here:

⁴⁵ 43, pp.771-2.

"Some of the most commonplace experiences, for the average white," says Garth, "are lacking to the average Indian. For instance, the hogun and tepee have no 'chairs,' 'tables,' 'cellars'. . . . But a knowledge of such commonplace things and their significance in civilization is presupposed in those who are to pass satisfactorily the white man's intelligence tests."⁴⁶

It is unnecessary to labor this point. In such cases it is obvious. However, the same thing may be true in a much more subtle way of the differences between country and rural children. For some reason, our city tests may not fit our country cousins, so to speak.

So, as has been described, we attempted to make a test for rural children in exactly the same fashion as a test had been constructed for the urban group. This B test was then given

TABLE XX
GRADE DISTRIBUTION OF RURAL AND URBAN CASES—(Information B)

<i>Grade and Sex</i>	<i>Rural</i>			<i>Total</i>	<i>Urban</i>
	<i>1-Rm</i>	<i>Union</i>	<i>Undif.</i>		
3 <i>B</i>	38	3	47	88	
<i>G</i>	24	33	53	110	
4 <i>B</i>	280	104	52	436	136
<i>G</i>	278	117	53	448	161
5 <i>B</i>	267	121	56	444	119
<i>G</i>	219	119	59	397	114
6 <i>B</i>	245	119	38	402	151
<i>G</i>	235	113	54	402	125
7 <i>B</i>	244	95	53	392	79
<i>G</i>	207	112	34	353	77
8 <i>B</i>	164	121	28	313	
<i>G</i>	129	113	33	275	
9 <i>B</i>		121	24	145	
<i>G</i>		128	39	167	
10 <i>B</i>		77	20	97	
<i>G</i>		70	20	90	
11 <i>B</i>		43	4	47	
<i>G</i>		81	1	82	
12 <i>B</i>		52	2	54	
<i>G</i>		66	4	70	
Total	2330	1808	674	4812	962

⁴⁶ 57, pp. 383-4.

to the original urban and rural districts and to seven other rural districts. The distribution of cases may be seen in Table XX.

Table XXI and Graph V show the comparison of urban and rural children on Test B. (Incidentally the sex difference is clearly illustrated.) One-room school children have been taken as the basis of comparison. Whereas, for conventional reliability $\frac{\text{Difference}}{\text{Sigma } \sigma}$ must equal 3, here the $\frac{\text{Difference}}{\text{Sigma } \sigma}$ ranges from 5.56 to 9.33.⁴⁷ The conditions found on Test A (illustrated in Graph IV) have been exactly reversed and very emphatically.

TABLE XXI
RURAL AND URBAN SCORES ON INFORMATION B
Comparison Between One-Room and Urban (3 Schools) Averages.*

Grade and Sex	Rural		Urban			
	Aver.	σ	Aver.	σ	Diff. in σ Units	Chances that true diff. is above 0.
4 B	11.02	4.1	8.74	3.9	5.56	100 in 100
G	10.32	3.8	7.94	2.9	7.21	100 in 100
5 B	14.24	3.1	10.42	4.0	9.10	100 in 100
G	13.36	3.6	9.44	3.8	9.33	100 in 100
6 B	16.32	3.4	13.46	4.0	7.33	100 in 100
G	15.42	2.0	11.72	3.8	9.25	100 in 100
7 B	17.76	3.2	13.84	3.6	8.52	100 in 100
G	17.42	2.9	13.38	3.6	8.78	100 in 100

*Also see Table XXVII, Chapter VI.

A handful of other investigators have also been loath to conclude that urban children are superior to rural.

Gray and Marsden (1922), in England, tested children in the Yorkshire Dales and compared the results with those of town children. They conclude that "the country children examined are, as a group, more intelligent than *some* town classes we tested. . . . At least . . . our results do not support the assumption that the children in the country are much less intelligent than the children in the town."⁴⁸ The group studied was so small, however, that results can be considered only very tentative.

⁴⁷ The differences between one-room and union schools, elaborated in Chapter IV, pale into insignificance beside these results.

⁴⁸ 31, p. 231.

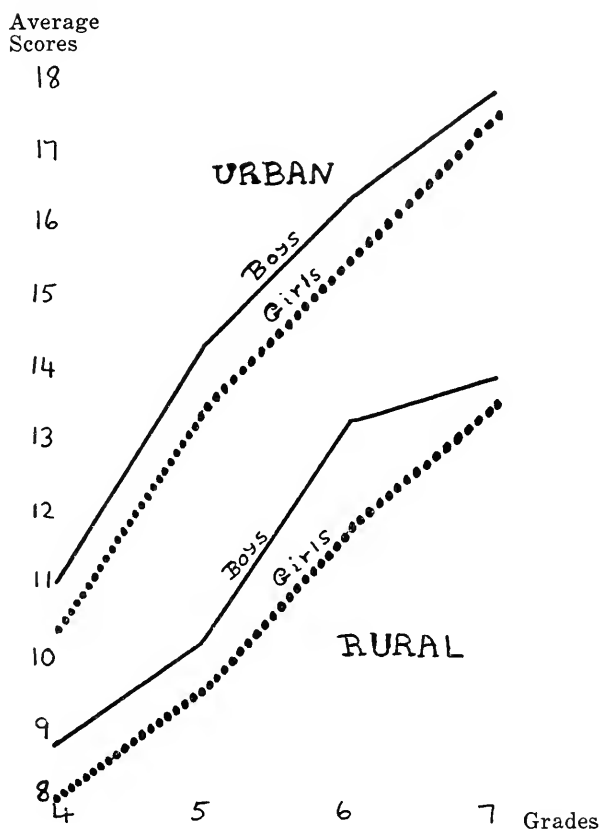


FIG. 5
Information B. Urban (Average 3 Schools)
and Rural (Average One-Room Schools)
Scores

The most important study has, unfortunately, to date been only briefly reported. At the American Psychological Association meeting, 1928, Baldwin and Fillmore reported as follows: "A study was made of all the children from birth to 16 years of age in four rural communities in Iowa in which children attend one-room schools or consolidated schools, and of a control group in an Iowa city with a population of 15,000."⁴⁹ "When compared in intelligence with children at large by means of established norms, and when matched with city children, the rural infants show no noticeable differences; the rural pre-school children show some inferiority at the upper

⁴⁹ 22, p. 185.

ages, and the rural school children show mental retardation that becomes increasingly apparent as they progress through school. . . . An analysis of the results of verbal intelligence tests reveals a striking difference in the language ability of rural children in contrast to city children. An analysis of the non-verbal reactions to the performance tests shows that while the rural children are handicapped by a slower rate of action, they show superiority on certain tests that probably relate to their experiences."

"These results raise the fundamental question: Are these inherent differences between the mental traits of rural children and of city children? Are the differences that have been found due to development and environment? Or are any of the present tests for measuring traits and their development adequate for rural children?"⁵⁰

We contend that they are not, and believe that the point has been at least partly proved by the demonstration of the fact that urban pupils do as poorly on rural-scaled tests as vice versa.

Several objections may be raised here. In the first place, have we perhaps so selected our rural questions that they favor our rural subjects unduly? It would, of course, be easy to pick questions that would be so specialized in character as to ensure the inferiority of any other group tested with them. We do not believe that this argument can be fairly launched against us. Our 80-question preliminary sheet for the rural test was chosen in precisely the same manner as the 80-question preliminary urban test, *i.e.*, from the questions submitted by the teachers of the children of the group. Any bias on the part of the author (herself distinctly an urban product) was in favor of the urban children, since with the rural tests all questions were eliminated which seemed to her to be at all specialized. In the final test, moreover, it must be remembered, the questions were not selected on the basis of ease of response for rural children, but ran from very easy to very difficult for that group. If, in the more or less mechanical selection of questions with the same number of sigma units of difference between them, questions particularly favoring the rural children were chosen is not this criticism equally true of our urban test and of practically all other tests? Our

⁵⁰ *Ibid.*, pp. 185-6.

B test is certainly no less fair to urban children than all other tests may be to rural children.

We have analyzed in detail the B papers of a number of rural and urban children (taken in exactly similar proportion from grades 4-7). On question 4 the urban children had a larger percentage of correct answers. (See Table XXII.) Questions 2, 13, 14, 15, 17, 18, 20, 21, 25 seem to be equal in difficulty for the two groups.⁵¹ On the remaining 15 questions, the average sigma difference in favor of the rural children is .53.

TABLE XXII
QUESTIONS FAVORING URBAN OR RURAL GROUPS (Information B)
Comparison Between School II and 3 Rural Districts

Question	σ Difference (Favor of Rural)
1	.48
2	.18
3	.47
4	— .57
5	.20
6	.49
7	.35
8	1.64
9	1.05
10	.47
11	.63
12	.47
13	0
14	— .07
15	.19
16	.21
17	— .19
18	.05
19	.58
20	— .02
21	— .06
22	.30
23	.40
24	.20
25	— .16

Considering that the sigma values run as high as 4.61, this difference is so comparatively small that we may say confidently that though, of course, these questions did favor the rural children, as the A questions favored the urban children, still they were not at all unfamiliar to the latter group or outside his scope of information.

We also attacked this problem from another angle. It will

⁵¹ In this study, a difference of less than .2 sigma has been discounted.

be remembered that nearly 50% of the questions in the original preliminary scale to the *urban* test were included in preliminary scale B. Studying these 36 overlapping questions (shown in Table XXIII), we find that 17 are passed equally by the rural and urban groups, 8 are to the favor of the urban group and 11 to the advantage of the rural group.

TABLE XXIII
OVERLAPPING QUESTIONS
Favoring Rural or Urban Children?

	σ Difference (Favoring Urban)
How many cents are there in a quarter?	— .22
What may we expect when we see heavy black clouds?	— .90
What is our national song? . . . . .	.20
How much does it cost to mail a letter to any city in the U. S.?	— .14
Of what is butter made?	— .80
What holiday do we now celebrate that was first celebrated by the Pilgrims? . . . . .	.52
How many sides has a triangle? . . . . .	.35
How old must you be before you can vote? . . . . .	.10
Of what is paper made? . . . . .	.16
How many states are there in the U. S.?	— .27
Name four different trees. . . . .	.06
Who was the first president of the U. S.?	— .03
How many pints are there in a quart?	— .30
What do the stars in the American flag represent?	— .06
What is the capital of the U. S.?	— .12
What is the shortest month in the year? . . . . .	.20
What is a submarine boat? . . . . .	.35
Who is the Governor of your State?	— .07
What is the largest city in the U. S.?	— .43
Who was the President of the U. S. during the World War? . . . . .	.67
Why should we kill flies?	— .49
Why is it dark at night? . . . . .	.03
Name a country in Europe which is a republic. . . . .	.13
How many weeks are there in a year?	— .02
Why don't we see the stars in the daytime?	— .38
About how often do we have a full moon?	— .06
Where does Congress meet? . . . . .	.09
What causes an eclipse of the sun? . . . . .	.23
Why do we celebrate the 4th of July?	— .30
What artificial waterway connects the Atlantic with the Pacific?	— .17
What is steam?	— .02
What form of government have we in the U. S.?	— .08
What is the economic value of Alaska to the U. S.?	— .14
Of what is rubber made?	—1.16
Why is the moon light at night? . . . . .	.46
Name two stones used for building purposes.	— .28

Leaving out one large difference (for the question "Of what is rubber made?") the average superiority for the urban group is .37 sigma, and for the rural group .44 sigma. Hardly a substantial difference! This would seem additional proof for our statement that the groups are different, not inferior or

superior. That there is a slight advantage, on the whole, for the rural group is interesting. These overlapping questions were all in the preliminary urban test, but necessarily of those not included in the final test. The first part of the preceding statement shows that we did not intentionally frame our test to fit one specific group. But, as the latter part of the sentence suggests, in the scaling the more urban questions apparently were automatically selected.

It may be well, at this point, to consider how we did get from 80 questions, which might presumably have fitted any group, an urban test A in the one case and a rural test B in the second. There are several steps in the testing process: (1) selecting the preliminary questions; (2) scaling the test from any group's percentage of correct answers on each question; (3) the standardization of the test. It is obvious that the last named process can not affect the test. We have shown that the selective process did not occur in the first step. By this we mean that either a rural or an urban test could have been scaled from the same original 80 questions. The second step must be the deciding factor. We select from the material tried out on the urban group, for example, questions evenly distributed throughout all the ranges of difficulty for that group. Apparently, however, this selection does not equally strike the various ranges of difficulty for another group. It may be that instead of one 1 question (*i.e.*, 1 in difficulty), one 2 question, etc., being included there may be three 4 questions for the second group. So, if the individual's range of ability is less than 4 he has a much lower score if he is from the second than if he is from the first group. It might, of course, happen that the test was easier for the second group; that the range of questions was skewed in the direction of the easy questions. This is not true, however, with either of our groups and is probably much less likely to be true.

We may say, then, as a general rule, that if, on a group homogeneous in respect to one quality, one scales a test according to the procedure outlined above, it will not equally tap all ranges of ability in a second group homogeneous in respect to a different quality.

The point has been raised whether this would be true of 8- and 10-year-old age groups, for example. This brings us into a somewhat different realm. A 10-year-old group is not really homogeneous in regard to a different quality than an 8-year-

old group. The first group is merely more mature, farther along the same path.

Even in age and grade groups, however, it would be possible, by scaling on one group alone, to produce a test not valid for other groups. In our scale, the preliminary questions were tried out on all ages and grades. Any question that seemed to single out one level was eliminated. For example, the question "Where are the Great Lakes?" elicited 50% correct answers from 7th graders and only 20% from 11th graders. This was obviously because this question is studied in the 7th grade and forgotten by the 12th. But this illustrates the fact that if one used only 7th grade children one might scale a test not entirely fair to even an older age group.

The two analyses quoted above also proved that we cannot tell *a priori* which questions are going to favor a certain group. A glance at Tables XXII and XXIII will bring this out clearly. It seems strange, for example, that the rural children do not have the advantage in "telling one way to find out the age of a tree," "giving one reason for the rotation of crops," "locating the Pole Star," etc.

To further substantiate this point (that questions favoring one group cannot be selected *a priori*), the overlapping questions plus a few others from Scale B were given to 14 rural superintendents, with the following directions: "Place a check mark beside each question which you think favors rural children (*i.e.*, in which rural children might be expected to excel), an equal sign where the chances of rural and urban children would be alike. If the question seems to favor the urban child, leave it unmarked."

The superintendents' answers were scored wrong *only* if they favored rural instead of urban or vice versa. Equal judgments were not recorded. The percentage of definite judgments made was computed. The average for our 14 rural superintendents was 82%. This seems high until we consider that with our scheme of marking, there was a 50% chance for a correct judgment. Under these conditions, such an average from a group of experts in the field is significant. If they can actually designate as distinctly rural what is apparently distinctly urban (or vice versa) on even two questions out of the 25, we certainly cannot safely decide *a priori* that any test favors or disfavors or is equally fair to any group or groups.

The same test was tried out on the Graduate Seminar in

Psychology at Columbia University. The 16 papers were recruited from members of the staff and graduate students. This might be considered, I think, a distinctly urban group. The average per cent correct was 83. This is practically identical with the findings reported above and is to be interpreted similarly.

Reisner, in a study of 8th grade pupils in Pennsylvania, conducted a somewhat similar investigation. A number of people acquainted with testing and rural and urban life were asked to classify the questions on Otis Self Administering—Intermediate Form B, as to whether they were strictly urban, strictly rural or intermediate. This brought out several interesting results. (1) There was a great difference of opinion among the judges themselves. (2) Questions might be correct from a rural standpoint but not included in the urban key, *e.g.*, "What is the most important reason that bright lights are placed in front of the theatres? so that people can see where they are; to attract attention and look inviting; so that people can see the advertisements better; electricity is furnished to theaters cheaply; to help light up the streets." Probably the first answer would be most reasonable in places where it is hardly necessary to present a lure to jaded tastes. (3) The urban children did better even on many questions which were classified as rural, especially where word meanings were involved. In computation, however, the rural group excelled.

We cannot subscribe to Reisner's conclusion: "This . . . brings out the fact that urban pupils score higher than rural pupils on the questions classed as strictly rural as well as on questions classed as strictly urban."⁵² Having obtained five judges who, with several differences of opinion, rated the questions, Reisner then concludes that certain questions *are* rural, etc. This is very fallacious reasoning. That it is possible to select questions which favor rural children is shown by our study. It is not wise to assume that the objects around one are necessarily familiar.

Both our own and Reisner's study seem to point conclusively to the fact that *a priori* judgments have little validity and are a very frail structure on which to build reliable comparisons.

In the second place we may be criticized for any general conclusions we may make since we have, unlike most of the

⁵² 41, p. 24.

other investigators, used only an information test and not an intelligence test. We did this advisedly. We believe that it is the information difference that is so very important. A standard intelligence test is such a composite that one's total score doesn't tell a very complete story. But is it not true that information figures largely in practically each one of the tests? Some of the group tests contain sections avowedly informational, but such tests as analogy tests, definitions, etc., presuppose a certain amount of information. One may reason remarkably clearly, but the ease with which one completes

A policeman is to a burglar as a cat is to a . . .

is a function of one's familiarity with the duties of a policeman and the vocation of a burglar. It may be argued, of course, that the information required is so slight as to be the property of all concerned. This, however, is not true. At the higher levels the information required is almost prohibitive, as for example, in the vocabulary test of the Thorndike C.A.V.D. test, *e.g.*

Sub series Q. (To supply word in line meaning same as first word.)

- | | |
|----------------|---|
| 21 radial | light, agitator, straight line, root, ray |
| 22 sequestrate | follow, petition, horseman, confiscate, redwood |
| 30 auricular | golden, heard, jointed, distinct, clear. |

It may be objected that we are confusing language ability and information, but is the difference, after all, very real? If you've never seen or heard of an orange, you can't define it. And, moreover, if your way of living does not lead to the absorption of literature containing such words as "radial" or "auricular," you won't succeed well in this test. On the whole, of course, it is true that intelligence may be gauged by one's ability in such language tasks, but comparisons can be made only when the testees' environmental opportunities have been equal. As Thorndike himself phrases it: "The problem of analyzing a person's intellectual ability into the amount due to nature and the amount due to nurture is unsolved. No task or test has been proved to be a measure of the former alone. The wisest procedure at present is to equalize environmental forces by a wide variety of data with which all individuals have had adequate experience and to make as correct allowance as we can for what we cannot equalize."⁵³

⁵³ 4, p. 462.

But the selection of such tasks (*i.e.*, those with which all have had equal experience) cannot be made *a priori*. This has surely been abundantly demonstrated in the preceding section.

Thorndike has lately supported the hypothesis that "the higher forms of intellectual operation are identical with mere association or connection forming, depending upon the same sort of physical connections but requiring many more of them."⁵⁴ He submits this hypothesis "to an almost crucial test by determining the correlations within the upper half of intellectual operations with those in the lower half and those between the upper and lower halves." As a measure of the "higher" he used sentence completion, arithmetic problems and analogy tests. As means of more purely "association," vocabulary tests, routine and informational arithmetic and information tests. The "higher" abilities were found to correlate as closely with the associative as *inter se*, and vice versa. "These facts . . . prove that mere association and the higher abilities have in the main the same cause. Almost all of what is common to the one sort is common to the other."⁵⁵

To those, therefore, who would criticize us for making any general conclusions from results on information tests or alloying our results with the broader studies of other investigators, we may say (1) that intelligence tests are, in some measure at least, information tests; and (2) that the same abilities are, to some degree, tested by mere information tests as by a more complex battery.

When we come to analyze the results of some of our authors who have given details of their work, we are driven still more firmly to the hypothesis advanced heretofore. In those cases where investigators have carefully analyzed their data they agree with us, in the main, in attributing the obtained differences to reasons other than to the innate inferiority of one group.

Pyle and Collings, (40), for example, find that the rural children approach the urban children more on the non-linguistic tests.

Chapman and Eby, comparing 15 one-room rural schools in Ohio with a large city school, conclude that "the superiority of the city school children over the one-room rural school children varied approximately in direct proportion as the de-

⁵⁴ *Ibid.*, p. 422.

⁵⁵ *Ibid.*, p. 430.

mands made by the test called for special school instruction as opposed to general powers which the school can do little to make or mar."⁵⁶

In several studies, as for example, the New York school survey (48), the rural children have been found to be equal to the urban subjects in arithmetic even though markedly deficient in other studies.

In the Bickersteth study, the Leeds (urban) children were inferior to the Dales (rural) children in memory work and not consistently better in cross-out tests, etc., but superior in reasoning (as measured by the Burt analogy test; examples of which are policeman : burglar : : cat : writing : typewriter : : voice :).

Bickersteth appends the following significant note: "If the superiority of the Dales children in the memory test were indeed a racial characteristic, we should expect to find it unchanged in the Leeds children of Dales ancestry, but of 31 such children, all but five were considerably below the average for their respective ages in the Dales group, but the same children were above the Dales average in the reasoning test."⁵⁷

Lehman and Witty, investigating the play activities of rural and urban children, find that their recreations are very different and believe that these differences are "directly traceable to environmental opportunities." The possible implications of their study they state as follows: "Numerous investigators have yielded data which show that rural children are somewhat below city children in mental age. . . . It is . . . plausible to assume that the lower mental age ratings of the rural children are . . . a result of the situation revealed by the above data. In administering mental tests, it is assumed that the individuals tested have similar environmental backgrounds, equal opportunities for acquiring information, etc. . . . It is evident . . . that the rural and the city children do not have the same social contacts, . . . certain it is that the environment of the town and country children are quite different and these environmental differences *may have* an influence upon the mental age ratings of the two groups of children."⁵⁸

Baldwin and Fillmore, to whose study we have already re-

⁵⁶ 27, p. 644.

⁵⁷ 23, pp. 66-7.

⁵⁸ 35, pp. 124-5.

ferred in some detail, found that whereas rural and urban infants and younger pre-school children were alike in mentality, the divergence between the two groups increased with age. They question whether the differences are inherent or due to development and environment, or whether we have any tests equally suitable for the measurement of the two groups. It must be admitted, of course, at the outset, that if the rural group *were* inferior, the difference would become more marked with age. Such a curve does represent our feeble-minded norms in divergence from the average. However, is not the following also a possible explanation of Baldwin and Fillmore's results? In infancy tests we are compelled to use more or less universal material. As the children grow older the tests become more and more linguistic and necessarily more and more tinged with environmental verbiage. If the thesis that we have set forth in this chapter is correct, this would also account for the growing inferiority of the rural group. And, with this explanation, certainly no more hypothetical than any other, Baldwin and Fillmore's results neatly dovetail with our own.

SUMMARY

1. The importance of data about rural children is evident when we realize that in 1924 there were 10 million children enrolled in rural schools.

2. The bulk of evidence from previous studies points to the conclusion that rural children are inferior to urban children mentally and scholastically.

3. We have offered the hypothesis that this difference is due not to any innate intellectual difference between the two groups, but to the tools used in measuring them.

4. To obviate this difficulty our Information Test B was scaled on rural children just as our Test A was scaled on urban children. Each test was administered to both groups of children.

5. On Information A the rural group was found to be about a year retarded in comparison with the urban group.

6. On Information B, the situation was entirely reversed.

A perfectly reliable difference $\left(\frac{\text{Difference}}{\text{Sigma}} \right)$ ranging from 5.56 to 9.33) was found between the performances of the urban and rural groups.

7. A handful of other investigators have come to conclusions that may be compared with ours—notably Baldwin and Fillmore in their very comprehensive study.

8. Analysis of urban and rural answers on Test B, and of overlapping questions in preliminary tests A and B, points to the conclusion that Test B is no more specialized in favor of rural children than Test A (or any standard test) is specialized in favor of the urban children.

9. From the same analysis we produced evidence that questions “fair” to a certain group cannot be selected *a priori*. This was also affirmed by submitting our questions to 14 rural superintendents who, despite their unusually rich experience, were unable to designate correctly (in a fairly large percentage of the cases) which questions favored the rural children.

10. An analysis of current standard group tests shows that a large part of the material required is informational in character. So, our results may be said to have some application outside the narrow sphere of individual information tests.

11. Through the entire rather involved chapter, we have attempted to follow the thread of this inquiry: “Are the mental differences found between urban and rural groups a function of an innate intellectual difference or of the tools of measurement?” Our results seem to point to the second explanation as possible and indeed probable.

CHAPTER VI

THE NATIONALITY OF THE SUBJECTS AND THE CORRESPONDING SCORES

The question of racial and national differences has long been a fascinating one, especially in this country which draws its peoples from such varied sources. The results of the Army examinations roused fear in many quarters, and gave rise to such statements as the following: "We are being swamped with the offscourings of Europe. . . . We have no place in this country for 'the man with the hoe' stained with the earth he digs and guided by a mind scarcely superior to the ox whose brother he is."⁵⁹ The influence of such a view (*i.e.*, of the native inferiority of other races than our own) on our social and economic policies is hard to estimate.

In the next few pages the outstanding studies on the various groups of foreign born in America have been sketchily summarized so that we may grasp, if possible, the general trend in this field. In examining these studies, we hope the reader will keep in mind the viewpoint of this paper, *i.e.*, that the tools of measurement must be evaluated as well as the intelligence of the subjects tested by them.

NEGRO STUDIES

A very short time ago, the current findings as to the racial inferiority of the negroes could be summed up as follows: "On the whole, there are found to be distinct differences between the two races considered, both as to intellectual ability, as measured by the tests used, and in school achievement. . . . It is shown that overlapping in intelligence is to the amount of 15 and 25% of the colored race who reach or exceed the median of the white."⁶⁰

Now, no such simple statement would be adequate or acceptable. In articles referred to in the bibliography, Peterson (65), Wells (70), and Sunne (67) have stressed the importance of environment and training and the impossibility of comparing the groups when, for generations, these factors have not been equal. Sunne and Davis (56) and Pressey and

⁵⁹ 68, p. 611.

⁶⁰ 71, p. 85.

Shively (2) have pointed out the probable unfairness to the negro group of test material now being used. Davis has shown the importance of equalizing educational opportunities. Two recent studies of Klineberg and Herskovitz may be briefly quoted here to show how far the pendulum has swung. Klineberg, 1927, used performance tests with white, indian and negro children. His results seem to show that the speed factor in the performance is largely environmental, not racial.⁶¹

Herskovitz measured with the Thorndike College Entrance examination 539 adult male negroes divided into eight classes, according to white characteristics. "The hypothesis of less negro intelligence and racial efficiency," says Herskovitz, "when compared to whites, which has been generally accepted from results in psychological tests, must be further tested by the acceptability of its logical corollaries." One of the chief of these, he believes, is that in mixture, those individuals having the most white blood should be superior to those having more negro blood. The correlations of the psychological with such physical characters as width of nose, thickness of lips, etc., were found to be entirely insignificant. Herskovitz discounts Ferguson's results on the ground that the discrimination within the negro group against those individuals showing such negroid traits as dark skin color, would cause differences in social environment which would affect the mean standing of groups selected on the basis of these traits."⁶² He concludes, in the light of his findings that "the basic hypothesis of white superiority in general social efficiency and innate intelligence is to be gravely doubted."⁶²

ORIENTAL STUDIES

All the comparative studies of orientals agree that the Chinese and Japanese children are not, on the whole, inferior to American children except where obviously handicapped by language difficulties. Particularly interesting to us are the results of Wang who, in 1926, tested Chinese and American college students (paired) with a series of tests. He found the Chinese decidedly superior to the Americans on number series tests, but decidedly inferior on *general information* which most involves language difficulty and knowledge of American life and customs⁶³.

⁶¹ 63.

⁶² 59, p. 42.

⁶³ 69, p. 104. Italics are ours.

INDIAN STUDIES

The bulk of the studies of Indian children has been contributed by Garth. He concludes that although on our tests the Indians score somewhat below the white, still "because of differences in social status and temperament we cannot conclude that our results are true and final measures of Indian children."⁶⁴ This is made more emphatic by the previous detailed discussion of the difficulties involved in giving our tests to Indians who lack our most commonplace experiences.

Helmer, in an unpublished thesis, reports an attempt to frame a test made up from experiences common to three Indian tribes. After trying out this test on both whites and Indians, she finds that those tests best adapted to the Indians are least adapted to the white, and concludes that "it would be difficult to make tests which would fit both the Indians and whites equally well."⁶⁵

Klineberg, 1928, finds with Indian children much the same results as those reported above with negro children, *i.e.*, "There is evidence that the superiority of white over Indian and negro children in performance tests is largely if not entirely a superiority in scores for *time*. There is no superiority; and in some cases an inferiority in the scores for *accuracy* of performance."⁶⁶

COMPARATIVE STUDIES ON OTHER NON-NATIVE GROUPS IN AMERICA

The question of whether verbal material is an important factor in our testing of foreigners, has been emphasized in many articles. There is some reason to believe that Italians rank below Americans on all our tests. As far as the other groups go, however, the two following quotations fairly sum up the trend of current opinion based on experimental evidence.

Hirsch, 1925, comparing his results on 11 groups with those of Brigham, says: "We can fairly and safely state that from 30% to 40% of the mental differences between the English and the combined non-English speaking groups as tested in the Army were due to a language handicap."⁶⁷

⁶⁴ 57, p. 389.

⁶⁵ 58, p. 76.

⁶⁶ 63, p. 107.

⁶⁷ 60, p. 341.

Kirkpatrick states that "there is no denying the fact that the superiority of the Americans is chiefly on the verbal tests."⁶⁸

There is some evidence to the effect that even where presumably "non-verbal" tests are used, the foreigners have still some language handicap.

Jones gave the Myers mental measure (presumably non-verbal) and two verbal tests to children of native and foreign parentage. The results seemed to point to the following conclusion: "The fact that a test is composed exclusively of non-verbal material is, therefore, no proof that it has merit as a non-verbal test."⁶⁹

Koch and Simmons, using the Meyers Pantomime and National Intelligence test with native and foreign children, make this statement: "While the pantomime test reduces to a minimum the language handicap of the foreign group, it is not to be assumed that the test permits all of our subjects to operate under equally favorable conditions. It is questionable, for instance, whether our groups have had equal opportunity to familiarize themselves with many of the concepts included in its content."⁷⁰

We wish to draw attention to the last sentence. This is precisely what we have inferred from the use of our tests with urban and rural, native and foreign-born children.

All in all, we may perhaps subscribe, at least to some degree, to the recent statement of Dale Yoder on the present status of the question of racial differences. "It may be correctly concluded that the consensus of competent scientific thought, contemplating the inability of mental testers to define intelligence, the inadequacy of all attempts to take such factors as education, social status, and language, into proper consideration and the deficiencies of testing conditions, finds no proof of racial inferiority or superiority and eliminates the usual methods of determining such standing from the field of scientific usefulness."⁷¹

We may safely say that there is a growing conservatism as to the conclusions we can draw, and more and more a dis-

⁶⁸ 62, p. 90.

⁶⁹ 61, p. 207.

⁷⁰ 64, p. 35.

⁷¹ 72, p. 470.

position to criticize our tools rather than our subjects in the case of our foreign-born.

However, whether or not experiments show conclusively that it is the language or special informational character of our tests that penalizes the foreigner, at any rate it will be universally conceded that the performance of foreigner and native on these tests is *different*. So it is extremely important to know whom one is testing. We have already commented on the use of deplorably small numbers in establishing norms. When we add to this the fact that the children in one school may be chiefly Italian while the children in the second may be Finn or Russian or fifth-generation Americans, it is obvious that comparisons are meaningless.

Armstrong's study (55) of rural and urban children is interesting in this respect. She tested 115 rural children in Katonah, N. Y., and 328 urban children in New York city. Contrary to usual results, the rural children, on both verbal and non-verbal tests, ranked higher. Analysis showed, how-

TABLE XXIV
PARENTAGE OF SUBJECTS—Information B

Subj. Group	No. of Cases	S. and 2 Parents Amer. Born	S. and 1 Parent Amer. Born	S. only Amer. Born	S. and 2 Pars. Foreign Born	No. of Countries Represented
<i>Rural</i>						
		%	%	%	%	
Dist. A	436	84	11	2	3	4. 60% Canadian
Dist. B	262	77	6	16	1	11. 46% Swedish
Dist. C	370	86	5	9	0	9. 21% Austrian 21% Czech
Dist. D	519	88	5	6	1	10. 32% Austrian
Dist. E	561	55	19	20	6	13. 23% Canadian
Dist. F	1026	72	15	11	2	15. 22% Polish
Dist. G	338	94	2	3	1	5.
Dist. H	680	80	8	10	2	14. 25% Russian 19% Italian
Average (weighted)		77	13	7	3	
<i>Urban</i>						
Sch. 1	283	13	16	65	6	14. 39% Italian 45% Finn
Sch. 2	247	73	12	9	6	10. 21% Irish 25% Canadian
Sch. 3	342	19	14	59	8	14. 63% Italian 13% Russian
Average (weighted)		32	14	47	7	

ever, that the rural group was entirely American (for several generations) while the urban group was very heterogeneous nationally. When the latter was analyzed as to parentage it was found that differences were a function of the number of generations in this country.

We have analyzed our groups according to the birthplace of the parents. These data (in Table XXIV) are presented for

TABLE XXV
Urban Norms—Information B

School 1			School 2				School 3		
Yrs. and Sex	No. of Cases	Aver.	σ	No. of Cases	Aver.	σ	No. of Cases	Aver. σ	
9 B				18	10.12	4.24			
G				11	8.82	4.04			
10 B	30	8.80	3.32	34	11.42	3.82	38	8.74	3.98
G	49	8.56	2.64	30	9.26	3.00	35	8.54	3.92
11 B	35	11.00	4.22	25	13.32	4.30	44	9.82	4.18
G	56	9.74	4.00	41	12.08	4.28	36	8.06	3.72
12 B	47	12.36	4.08	50	15.04	3.48	46	11.66	5.16
G	36	11.22	4.08	42	13.80	3.82	37	10.08	3.82
Gr. and Sex									
4 B	48	8.62	3.38	48	10.38	4.44	40	6.90	2.82
G	68	7.76	2.56	47	8.92	3.00	46	7.24	3.12
5 B	31	10.22	3.76	31	12.42	3.30	57	9.42	4.12
G	44	9.90	3.64	23	10.14	3.16	47	8.66	3.88
6 B	46	13.40	2.60	53	15.26	3.10	52	11.66	4.88
G	43	10.82	3.30	47	13.46	3.82	35	10.48	3.46
7 B	25	14.36	3.28	13	16.54	2.38	41	12.66	3.72
G	19	14.16	3.52	24	14.84	3.26	34	11.94	3.40
Average of 3 Urban Schools									
Yrs. and Sex						Gr. and Sex			
9 B	32	9.26	3.96			4 B	136	8.74	3.90
G	26	8.08	3.52			G	161	7.94	2.94
10 B	102	9.62	3.94			5 B	119	10.42	4.02
G	114	8.74	3.18			G	114	9.44	3.76
11 B	104	11.06	4.44			6 B	151	13.46	3.98
G	133	9.96	4.24			G	125	11.72	3.80
12 B	143	13.08	4.52			7 B	79	13.84	3.62
G	115	11.80	4.00			G	77	13.38	3.62

both rural and urban groups on Test B. It will be seen at a glance that the rural districts are chiefly American. Only 10% have both parents of the subjects foreign-born, and a considerable percentage of these are English speaking. The three large urban schools, however, are strikingly different in make-up. Schools I and III have about 70% of foreign-born parentage (on both sides). School II is closely similar to our rural districts with 73% (as compared to 77%) with both parents American born. Fifty per cent of the foreign-born parents, moreover, are English speaking (*i.e.*, Irish and Canadian). Of the foreign-born in District A (which received both A and B tests) 60% are also Canadian.

Average
Scores

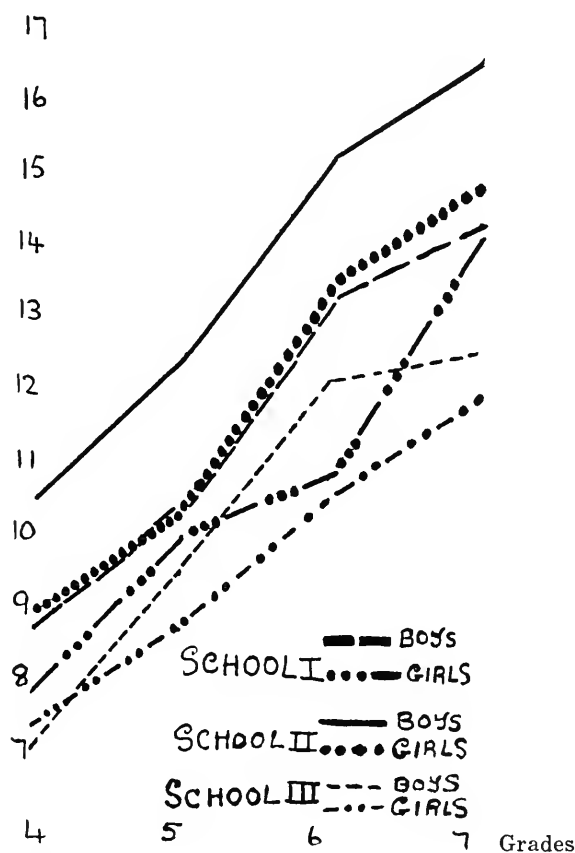


FIG. 6. Information B. Urban Scores

Table XXV and Graph VI show the scores of the three schools on Test B. Table XXVI shows the reliability of the differences between these schools. There is a very significant difference between Schools II and III, and a consistent though not entirely reliable difference between Schools I and II, and Schools I and III.

TABLE XXVI
COMPARISON BETWEEN THREE URBAN SCHOOLS

Reliability of Differences—Information B									
School 1 and School 2					School 2 and School 3				
<i>Yrs. Sex</i>	<i>Actual Dif. (Fav. Sch. 2)</i>	<i>σ Dif.</i>	<i>Dif. in σ Units</i>	<i>Chances True Dif. Above 0 (in 100)</i>	<i>Actual Dif. (Fav. Sch. 2)</i>	<i>σ Dif.</i>	<i>Dif. in σ Units</i>	<i>Chances True Dif. Above 0</i>	
10 <i>B</i>	2.62	.90	2.91	99.8	2.68	.93	2.88	99.8	
<i>G</i>	.70	.66	1.06	85	.72	.86	.84	80	
11 <i>B</i>	2.32	1.12	2.07	98	3.50	1.07	3.27	100	
<i>G</i>	2.34	.85	2.75	99.7	4.02	.91	4.42	100	
12 <i>B</i>	2.68	.77	3.48	100	3.38	.91	3.71	100	
<i>G</i>	2.58	.90	2.87	99.8	3.72	.87	4.28	100	
<i>Gr and Sex</i>									
4 <i>B</i>	1.76	.81	2.17	98.6	3.48	.78	4.46	100	
<i>G</i>	1.16	.54	2.14	98	1.68	.63	2.67	99.7	
5 <i>B</i>	2.20	.90	2.44	99.2	3.00	.81	3.71	100	
<i>G</i>	.24	.86	.28	61	1.48	.87	1.70	96	
6 <i>B</i>	1.86	.57	3.26	100	3.60	.80	4.50	100	
<i>G</i>	2.64	.75	3.52	100	2.98	.81	3.68	100	
7 <i>B</i>	2.18	.84	2.60	99.5	3.88	.88	4.41	100	
<i>G</i>	.68	1.06	.64	74	2.90	.89	3.26	100	
School 1 and School 3					School 1 and School 3				
<i>Yrs. Sex</i>	<i>Actual Dif. (Fav. Sch. 1)</i>	<i>σ Dif.</i>	<i>Dif. in σ Units</i>	<i>Chances True Dif. Above 0 (in 100)</i>	<i>Gr. and Sex</i>	<i>Actual Dif. (Fav. Sch. 1)</i>	<i>σ Dif.</i>	<i>Dif. in σ Units</i>	<i>Chances True Dif. Above 0</i>
10 <i>B</i>	.06	.89	.07	52	4 <i>B</i>	1.72	.66	2.58	99.5
<i>G</i>	.02	.76	.03	51	<i>G</i>	.52	.56	.93	82.5
11 <i>B</i>	1.18	.96	1.23	88.5	5 <i>B</i>	.80	.87	.92	82
<i>G</i>	1.68	.81	2.07	98	<i>G</i>	1.24	.79	1.56	93.5
12 <i>B</i>	.70	.97	.72	76	6 <i>B</i>	1.74	.77	2.26	98.7
<i>G</i>	1.14	.93	1.23	88.5	<i>G</i>	.34	.77	.44	67
					7 <i>B</i>	1.70	.88	1.93	97
					<i>G</i>	2.22	1.00	2.22	98.6

School II is outstandingly superior at all points. School I with 39% Italians is second, and School III with 63% Italians is lowest. This does agree closely with the findings of other investigators. We shall make no attempt to explain this phenomenon. Of course, under no circumstances can we make any generalizations concerning *Italian* intelligence. It may well be that the type of employment we have to offer selects out the lowest type of Italian for immigration. On the other hand, it may be that the Italians we have are not dull but that the tests put them at a special disadvantage, linguistically or otherwise.

Returning, however, to our rural-urban comparisons. It would be unfair to draw any conclusions as to rural superiority (on Test B) from the results of tests on Schools I and III. For the reasons outlined above, however, comparison with School II is entirely in order. Table XXVII and Graph VII show the differences between rural District A and urban School II. Whereas these differences are not as marked as in Graph V (Chapter V), still they are consistently and fairly reliably in favor of the rural district. In the former case, the $\frac{\text{Difference}}{\text{Sigma "}}$ is, at its lowest, 5.66, at its highest, 9.33 (where conventional reliability is 3). In the latter case, the average number of chances (in 100) of a true difference is 99.2.

TABLE XXVII
RURAL AND URBAN SCORES ON INFORMATION B

Reliability of Difference Between Rural District A and Urban School II.*				
Grade and Sex	Actual Difference (Favor of Rural)	σ Difference	Difference in σ units	Chances that true diff. is above 0
4 B	1.52	.79	1.92	97 in 100
G	1.80	.78	2.31	98.9 in 100
5 B	2.24	.77	2.91	99.8 in 100
G	2.64	.87	3.03	100 in 100
6 B	1.44	.63	2.29	98.9 in 100
G	1.80	.71	2.54	99.4 in 100
7 B	2.30	.85	2.71	99.7 in 100
G	3.42	.83	4.12	100 in 100

* Also see Table XXI, Chapter V.

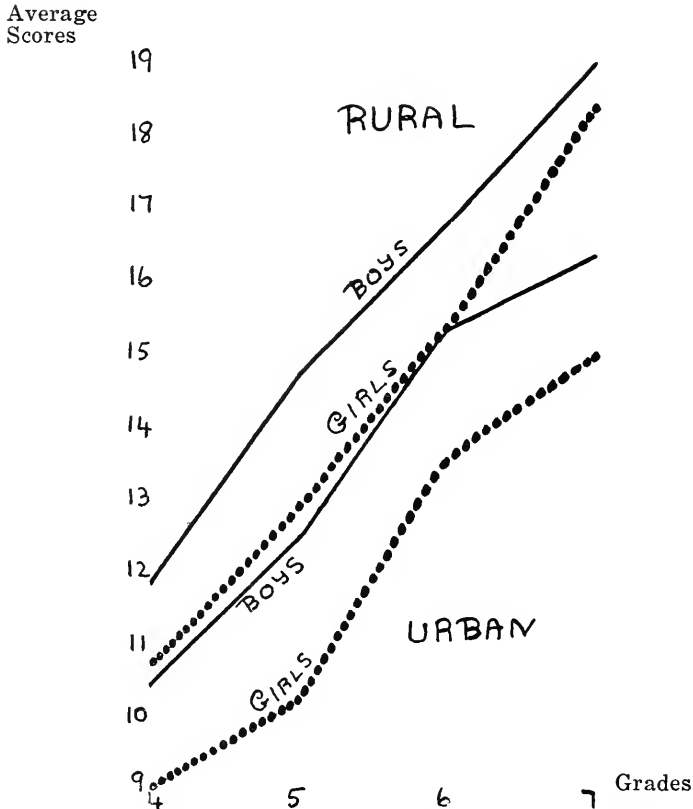


FIG. 7. Information B. Urban (School II)
and Rural (District A) Scores

Our conclusions as to urban rural differences on Test B still hold, therefore, when the two groups are equalized as to nationality components.

We have brought to light the striking differences between Schools I, II and III in the same city. Any one of these schools would have provided numbers as large as is used in most norm establishing, but the results in no two of them would have been alike. This is an extremely important point too often lightly passed over by standardizers.

The literature we have summarized has brought out the fact that the different races and nations differ decidedly in their informational and language equipment. It would seem superfluous to mention this except for the fact that conclusions are constantly being drawn without taking this sufficiently into consideration. In extreme cases, as, for exam-

ple, testing primitive man, they seem rather obvious, but when we are testing children who have been in our own schools and who live in our own country, we are too apt to class them all as living in the same environment, whether they dwell on farms or in foreign quarters, or in the shadow of the campus. Porteus and Babcock voice this criticism rather emphatically: "The Army Alpha test, if it does nothing more, proves conclusively how little the psychologists know of the mental range of the man in the street, the laborer on the farm, the mechanic in the shop, in short, of the average man whose intelligence he seeks to measure." . . . "Even so in directions, *e.g.*, Test VII, 'What you are to do in each line is to see what the relation is between the first two words and underline the word in heavy type that is related in the same way to the third word.' For the man whose only idea of relations is of his uncles and aunts, these directions would seem very involved and quite incomprehensible." More so in the vocabulary test: 'allure-attract; deride-ridicule; haggard-gaunt; orifice-aperture' are pairs of words which come quite early in this test and are surely outside the ordinary man's range of understanding. Quite evidently this is no test of intelligence except for those who have had considerable educational opportunities." . . . "How unfortunate that the farmers, the mechanics, the electricians, could not devise a test for the psychologists. If they did, one wonders what the mental age of the latter would appear to be."⁷²

SUMMARY

1. A brief summary of studies on racial and national differences in mentality seemed to point to the conclusion that we are growing more conservative in our interpretations. There is, in many quarters, at least some appreciation of the fact that no dogmatic conclusions can be drawn as to the comparative intelligence of various groups, while our tools and methods are still so imperfect.

2. Analysis of our urban and rural groups, according to the parentage of the subjects, reveals the fact that the rural population is very largely native American while the urban school population varied from 10% to 73% with both parents foreign-born.

⁷² 66, pp. 197-9.

3. School II, with the smallest number of foreign-born, is outstandingly superior on our tests.

4. The children of School II give us a fair basis of comparison with our rural subjects. But the difference on Information B, already elaborated in Chapter V, still holds when the national and racial composition of the two groups is equated.

5. The reliable differences found between the three urban schools (any of which contains a large enough number of cases to satisfy most norm makers) shows us how careful we must be in the selection of our subjects, and the caution we must observe in comparing groups. Mere numbers do not seem to iron out differences.

CHAPTER VII

SUMMARY AND CONCLUSIONS

Our aim, as stated in the introduction, was twofold: 1, to examine the importance of the differentiation of norms according to sex, racial composition, etc., and 2, to ascertain whether mental differences between groups were a function of their innate intelligence or our tests as tools.

In the six preceding chapters we have examined our data from these viewpoints and have arrived at certain conclusions summarized at the end of each chapter. On the whole, five conclusions are outstanding:

1. The adequate scaling and standardization of tests is the first essential of their use as reliable tools.
2. Large numbers, differentiation of the groups as to age, sex, education and natio-racial composition are absolutely necessary. Heterogeneous, hodge-podge groups are useless, if the results on one group are to be compared with those of another.
3. We have found that our rural group fell below the urban group on Information A, scaled on urban children. It is also true, however, that our urban children fell below the rural group on Information B, scaled on rural children. The groups, therefore, are *different* and inferiority is dependent on which group the existing tool favors.
4. Great natio-racial differences were found between our three urban schools. The test scores showed a distinct correlation with these differences. Extreme caution must then be used in the selection of groups for scaling and standardizing tests. We have observed that, in practically all comparisons, tests scaled on one group have been utilized, usually to the disparagement of the second group. Informational and language factors have been shown to be so important that such a procedure is obviously unfair and unscientific.
5. An analysis, from our own point of view, of the literature on national and racial differences leads us to the hypothesis that the groups are *different* rather than that one is *superior* or *inferior*.

It may be said, of course, and with some justice, that we have as much bias towards our interpretation of the facts

as the other investigators whom we have criticized. The reader, then, may take a middle course and steer between the two extremes.

For practical purposes, our findings, even if taken seriously, do not radically change the testing situation. It still is true, for example, that in order to do well in *our* schools a certain grade of performance on *our* tests is necessary. So it is perfectly justifiable to put any individual from any group through our tests and on the basis of the results classify him in a certain way in regard to a specific school, job, etc.

In the same way, we may put one of our own group through an elementary geography test and if he fails we may say with justice that he cannot be admitted to an advanced class. In neither case, however, can we draw any valid conclusions as to innate intelligence.

We have not meant in any way to disparage the value of mental tests. Rather, let it be said that we so firmly believe in their use that we are loath to see their scientific footing jeopardized by the way in which they have been treated by many investigators. At some time in the future we may so perfect our weapons of attack that we may make valid comparisons between different groups. At present, let us frankly admit that we have no adequate method of estimating in any final way the mental differences between the various races and nations. All studies must, then, be very cautiously received and evaluated according to the methods and tools used.

APPENDIX

PRELIMINARY SCALE A

1. What state do you live in?
2. What people were in America when the white men came?
3. What colors are in the rainbow?
4. Why does the beating of your heart keep you alive?
5. What is a submarine boat?
6. What causes an eclipse of the sun?
7. What is the value of the smallest silver coin we use?
8. Who is president of the United States?
9. What is the shortest month in the year?
10. Of what is rubber made?
11. How is it that newspapers can be sold for much less than the cost of printing them?
12. Of what are shoes made?
13. What is the largest city in the United States?
14. Name four different trees.
15. In what country is Vienna?
16. What is the usual economic result of the over-production of any commodity?
17. What is our national song?
18. Why should we kill flies?
19. In what month of the year do the days begin to grow shorter?
20. How can banks afford to pay interest on the money you deposit?
21. Why is it dark at night?
22. What form of government have we in the United States?
23. Name at least three bodily processes that go on when a person reading music plays the piano?
24. What is the shape of the earth?
25. Name three precious stones?
26. Why is the moon light at night?
27. How much does it cost to mail a letter to any city in the United States?
28. Of what is butter made?
29. What artificial water way connects the Atlantic with the Pacific?
30. Who was the first president of the United States?
31. Where does the sun rise?
32. Name a country in Europe which is a republic.
33. How do you know a policeman when you see him?
34. How many states are there in the United States?
35. Who is the governor of your state?
36. What is the function of respiration?
37. What may we expect when we see heavy black clouds?
38. What do the stars in the American flag represent?
39. What is a referendum in government?
40. Name five vegetables.
41. What is steam?
42. What is the economic value of Alaska to the United States?
43. What is the capital of the United States?
44. Why do we celebrate the Fourth of July?
45. What are the functions of the three branches of our government? (In three words.)
46. How many months are there in a year?
47. What three things do most plants need in order to live?
48. For how many years is the president of the United States elected?
49. What is the largest river in the United States?
50. In your city what is the youngest age at which a child can leave school?
51. Name the greatest English writer of plays.
52. Of what use are insects to flowers?
53. To what public building can you go for books?
54. Where does Congress meet?

55. What is a civil war?
56. How many cents are there in a quarter?
57. Why don't we see the stars in the daytime?
58. Why did the Pilgrims come to this country?
59. How many sides has a triangle?
60. How can you tell when water is boiling?
61. Who was President of the United States during the World War?
62. What holiday comes in December?
63. What part of the night or day is 12.30 A. M.?
64. What is the freezing point of water?
65. How many hours are there in a day?
66. How old must you be before you can vote?
67. Of what is paper made?
68. Name the Great Lakes.
69. What is vaccination for?
70. About how often do we have a full moon?
71. Name four general reasons that prevent a would-be immigrant from entering the United States.
72. What are the colors in the American flag?
73. What holiday do we now celebrate that was first celebrated by the Pilgrims?
74. Name five insects.
75. Name three wars in the United States fought with other countries.
76. How many weeks are there in a year?
77. Name two stones used for building purposes.
78. How many pints are there in a quart?
79. Name five cities of the United States that have a population of over half a million.
80. Why are there no shadows on a heavily clouded day?

KEY TO SCALED INFORMATION A

1. *Red, white and blue.*
2. *Leather, satin, wood, etc. (Any sensible answer is accepted.)*
3. *Twelve or twenty-four.*
4. *Christmas.*
5. *President at time of test.*
6. *Indians, red men.*
7. *State child lives in.*
8. *East.*
9. *Any five vegetables. (No partial credits allowed.)*
10. *Mississippi or Missouri-Mississippi.*
11. *Religious toleration, freedom from persecution, right to worship God in own way. (Any phrasing of above idea is accepted.)*
12. *Four years.*
13. *Sunshine or warmth, water or rain, soil or ground, air. Any three of the preceding (or their chemical components). Only one member of a pair accepted.*
14. *Circulates blood, sends blood through veins, pumps blood. (Any phrasing of this idea accepted.)*
15. *They loan it at higher interest, they buy mortgages. (Any answer that includes idea of using money accepted.)*
16. *Any five insects.*
17. *War between two parts of same country, same countrymen fighting, brother against brother, etc.*

18. At least *three* of *starred* cities below and *two* of the others: (Four starred and one other, or five starred.)¹

Akron	Columbus	Minneapolis	Providence
Atlanta	*Detroit	Milwaukee	Rochester
*Baltimore	Denver	Newark	St. Paul
*Boston	Indianapolis	*New York	*St. Louis
*Buffalo	Jersey City	Oakland	*San Francisco
Brooklyn	Kansas City	*Philadelphia	Seattle
*Chicago	*Los Angeles	*Pittsburgh	Toledo
Cincinnati	Louisville	Portland, Ore.	Washington
*Cleveland	*Manhattan		

19. Any answer that mentions advertising. (Large production not accepted.)
20. 32 or 32 Fahrenheit or 0 Centigrade. (Zero not accepted.)
21. Higher prices. (Waste, panic, etc., accepted.)
22. Executive or administrative, judicial, legislative. (Any phrasing of these ideas accepted.)
23. Quota exhausted, defective mentality, contagious disease, lack of funds, moral turpitude, criminality, beliefs contrary to United States Constitution, bigamy, member of excluded race. Any four expressions of above accepted. (Any doubtful answer should be looked up in latest immigration rulings.)
24. To supply blood with oxygen, to carry off waste material, etc.
25. Any answer that includes the idea of a legislative measure's being referred to people.

¹ Although the question calls for five cities with a population of over half a million, it was marked correct if three such cities (starred above) were given, together with three other large cities from above list.

PRELIMINARY SCALE B

1. What is our national song?
2. Name the young of the sheep, cow, horse.
3. Why don't we see the stars in the daytime?
4. Name *three* states in the U. S. where cotton is raised.
5. Name *four* different trees.
6. What is the correct temperature for a living room?
7. In what month of the year do the days begin to grow shorter?
8. How many cents are there in a quarter?
9. What makes cobwebs?
10. Where does Congress meet?
11. Why is it necessary to limit the hunting season?
12. Of what is butter made?
13. In what part of the day are the shadows longest?
14. Why is the moon light at night?
15. Draw a square and an oblong.
16. What is the capital of the U. S.?
17. Why do unsupported objects fall to the ground?
18. What is the largest city in the U. S.?
19. How can you tell poison ivy by looking at it?
20. About how often do we have a full moon?
21. How many pecks are there in a bushel?
22. What is the shortest month in the year?
23. Name *three* different plants from which sugar is made.
24. Of what use are insects to flowers?
25. What is the youngest age at which a child can leave school?
26. Name a famous American inventor and tell what he invented.
27. Name *two* stones used for building purposes.
28. What are the four seasons?
29. How many states are there in the U. S.?
30. Name *five* wild flowers.
31. Why does seasoned wood burn more easily than green wood?

32. What may we expect when we see heavy black clouds?
33. Tell one way of finding out the age of a tree.
34. Why does frost form on the *inside* of the window pane?
35. How many sides has a triangle?
36. From what animal do we get mutton?
37. What kind of cloth is made from flax?
38. From what does maple sugar come?
39. Who was the first President of the U. S.?
40. Name *two* birds that stay North in the winter.
41. How much does it cost to mail a letter to any city in the U. S.?
42. What do we mix with ice to help us freeze ice-cream more quickly?
43. How do sponges grow?
44. How can you keep milk from souring?
45. What do the stars in the American flag represent?
46. Name the continents in order of size.
47. Give one reason for the rotation of crops.
48. What holiday do we celebrate that was first celebrated by the Pilgrims?
49. Name *five* crops.
50. What causes an eclipse of the sun?
51. What kind of dairy cow gives the richest milk?
52. What is a submarine boat?
53. Why should we kill flies?
54. How many pints are there in a quart?
55. Why are crops hoed?
56. What is steam?
57. At what time of year do many leaves turn red?
58. Name *three* products made from wheat.
59. What form of government have we in the U. S.?
60. Name a vegetable that grows above ground.
61. What is a domestic animal?
62. Why do we celebrate the 4th of July?
63. Of what is paper made?
64. Who is the Governor of your State?
65. What artificial waterway connects the Atlantic with the Pacific?
66. How many months are there in a year?
67. Why is it dark at night?
68. How can you locate the Pole star?
69. How old must you be before you can vote?
70. Name a country in Europe which is a Republic.
71. What is the highest court in the U. S. called?
72. Of what is rubber made?
73. Who was the President of the U. S. during the World War?
74. Name *two* animals that hibernate in winter.
75. What is the economic value of Alaska to the U. S.?
76. What tree doesn't shed its leaves in the Fall?
77. Name *two* differences between the barks of birch and oak trees.
78. Name *three* uses of forests.
79. Name *five* fruits.
80. How many weeks are there in a year?

PRELIMINARY TEST—SCALED INFORMATION B

DIRECTIONS FOR ADMINISTRATION

1. There are three sheets of this preliminary test. Difficult and easy questions are scattered throughout. We are attempting to test the questions rather than the children. So it is very important that each question be given due consideration and that enough time be given for all the questions. We hope that you can give these tests (page by page) directly you receive them; *i.e.*, the first morning, questions 1-25; the second morning, questions 26-53; the third morning, questions 54-80. Fifteen minutes for each page will probably be sufficient.

2. Say to the children: "Some people are trying to find out what sort of questions boys and girls of your age can answer. They have asked us to help them. I'm going to give each of you a set of questions. Don't be discouraged because you can't answer all the questions, but be sure to do as many as you can. Try every question on the whole page. You are not going to be marked on your answers. In fact, you don't have to put your name on the paper at all. Do not start on the test until I tell you to do so."

3. Distribute the tests, one to each child. Have the children write on one of the top lines (in the box in the upper right hand corner) *Boy* or *Girl*. Be sure that each child gives his age in years and months, and his school grade.

4. When this has been completed, give the signal to commence the test. Do not give any help whatsoever. If you observe any child cheating, destroy his paper.

SCALED INFORMATION B

DIRECTIONS FOR ADMINISTRATION

1. Please give this test on the morning of May 1 (or as near then as possible).

2. Say to the children: "Some people are trying to find out what sort of questions boys and girls of your age can answer. They have asked me to help them. I am going to give each of you a set of questions. I want you to look at each one carefully and to write the proper answer in the space beside each question. Don't be discouraged because you can't answer all the questions, but be sure to do as many as you can. You are not going to be marked on your answers. In fact, you don't have to put your name on the paper at all. Do not start on the test until I tell you to do so."

3. Distribute the tests, one to each child. Have the children write in the box in the upper right-hand corner, *Boy* or *Girl*. Be sure that each child gives his age in years and months, and his school grade.

4. When this has been completed, give the signal to commence the test. Allow *15 minutes only*. Do not give any help whatever. If you observe any child cheating, destroy his paper.

5. After fifteen minutes give the signal to stop. Have every child turn his paper over. Tell each pupil to write the name of the country where he was born; underneath that, the name of the country where his father was born; and underneath that, the name of the country where his mother was born.

KEY TO SCALED INFORMATION B

1. Cream, milk, whey, cream and salt.
2. Two cents.
3. Spring, summer, autumn (fall), winter.
4. "Star Spangled Banner," "America," "My Country, 'tis of thee," "Oh, say, can you see?"
5. Squash, lettuce, tomato, cabbage, string beans, peas, cucumber, etc.
6. Lamb, calf, colt (pony, foal, filly).
7. Salt.
8. Any *four* different trees.
9. Sheep.
10. Dry, dryer, green wood is wet, crisp, contains less water.
11. Any *five* crops.
12. Pine, hemlock, fir, spruce, liveoak, cedar, palm, Christmas tree, evergreen, balsam.
13. Annual rings, rings, lines or marks in stump, cambium layers, layers in the trunk, size, height, tallness, extent of the roots, roughness of the bark, etc.

14. Light from the sun, obscured by the sun, daylight too strong. (Any answer mentioning brightness.)
15. Every four weeks, or month, or 28 or 31 days. Twelve times a year, etc.
16. Any *five* flowers.
17. Fisheries, minerals, furs or valuable skins, gold, coal, salmon, seals. Any money value over \$5000 a year.
18. Condensation of moisture, warmer inside, steam or vapor inside, heat in the room, heat and cold come together. Relative humidity of air inside and out.
19. Lumber, wood, fuel, draw water, prevent floods, keep soil in good condition, prevent landslides, shade, scenery and beauty, recreation, camping and health resorts, animal refuge or protection, hunting, trapping, home for birds, tar, petroleum, cork, dyes, medicines or chemicals from trees, maple sugar or sap, windbreaker, regulate temperature, etc. (Any *three*.)
20. Wilson.
21. Replacement of nitrogen, fertilization, different crops use up different substances in the soil, keep the soil from becoming exhausted, better crops, etc.
22. Sugar cane, beet, maple, sorghum, palm, corn, grapes. (Any *three*.)
23. June.
24. Reflection of the sun, light from the sun, sun shines on it, etc.
25. Big dipper, dipper, Great Bear, pointer stars, latitude, compass.

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